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ABSTRACT

Integration of environmental education and second language instruction is discussed, with two purposes: to describe educators' efforts to protect the planet's deteriorating environment, and to explore what destructive attitudes and actions that have led to environmental devastation have their counterparts in language education methods. The intended result is to heighten students' environmental awareness, knowledge, appreciation, and protective efforts through learner-centered instructional approaches, including learner-generated materials, cooperative learning, encouragement of creativity, integration of subject areas, and involvement with the community. The paper has three main sections. First, environment education is described and placed in the context of a global approach to education. Controversies in environmental protection are discussed briefly here. Second, the psychological and linguistics roots of a learner-centered approach to education are contrasted with those of a teacher-centered approach, and learner-centered classroom techniques are described. The third section contains environmental activities for second language learners using a learner-centered approach, including songs, data-based exercises, problems in decision-making, and making resolutions about protecting the environment. (MSE)

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ED 367 129

INTEGRATING ENVIRONMENTAL EDUCATION IN SECOND LANGUAGE INSTRUCTION

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Integrating Environmental Education in Second Language Instruction

Occasional Papers No 46

George M. Jacobs
SEAMEO RELC

RELC 410-93 SINGAPORE

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About the cover ....

The cover design depicts the left side of the globe deteriorating due to destructive attitudes, whereas the right portion of the globe is clear and free from all environmental disasters. The pictures on the left side of the globe depict, from top to bottom, environmental pollution from aerosol sprays which damage the ozone layer, water pollution, deforestation, air pollution, the killing of animals, and the greenhouse effect (see Glossary, Chapter 4).

Language education can integrate environmental education to create environmental awareness among students. To emphasize this point, key words from language and environmental education are displayed in eight languages. The languages, words, and their English translations are, in counterclockwise order:

Thai	- ความคิดสร้างสรรค์	- creativity
Malay	- *sekitaran*	- environment
Chinese	- 再循环	- recycle
Tagalog	- *pagsasamasama*	- integration
Tamil	- மொழி	- language
English	- *conservation*	
Japanese	- 教育	- education
Spanish	- *cooperaciõn*	- cooperation

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INTRODUCTION

If you are thinking a year ahead, sow seed;
If you are thinking ten years ahead, plant a tree;
If you are thinking 100 years ahead, educate the people.
Kuan Tzu, 400 BC

This paper has two related purposes. One purpose is to describe efforts by educators to contribute to global efforts to protect our planet's deteriorating environment. The second main goal is to explore how many of the same destructive attitudes and actions which have led to environmental devastation have their counterparts in methods used in language education and describe what I believe are superior methods. That is to say that in order to make the greatest possible contribution to raising the level of students' environmental awareness, knowledge, appreciation, and protective efforts, language educationists need to adopt approaches to teaching which, beyond including environmental content, decisively alter the educational enterprise.

These changes fall under the broad umbrella of increasing learner-centredness. Several means of achieving this are explained. These are: 1) the use of learner-generated materials; 2) cooperative learning; 3) inviting learners to be creative; 4) integration of subject areas; and, 5) involvement with the community.

This paper has three main sections. First, environmental education is described and put into context. Second, the psychological and linguistic roots of a learner-centred approach to education are contrasted with those of a teacher-centred approach. Here, emphasis is placed on the commonalities between views of the environment and of education from the perspective of two different paradigms. The paper's third section consists of environmental education activities for second language learners which follow a learner-centred approach.

Teaching situations differ in many ways. For those of us teaching students languages other than their mother tongue, one difference is whether we are teaching in a situation in which the new language is widely used, a second language context, or one in which the new language is not a main vehicle of communication, a foreign language context. While recognizing this difference, in this paper, the term *second language* will be used for both second and foreign language contexts.

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I wish to acknowledge the assistance received in many aspects of this project from many members of the SEAMEO RELC staff, in particular the Director, Mr. Edwin Goh, who took a great interest in the paper and provided the necessary time to complete it. Publications Manager, Mr. K.W. Wong, helped arrange for publishing on recycled paper. Mr. Anthony Butterworth, Mr. B.R. Sundara Rajan, and Dr. M.L. Tickoo contributed valuable feedback. Ms. Retnam Kavariammal helped greatly with the format and the cover design.

Thanks are also due to the librarians, those great facilitators of learner-centred education, at RELC and other institutions in Singapore. I would also like to acknowledge the inspiration provided by Dr. Padmasiri de Silva of the Information & Resource Center in Singapore, a leader in environmental education in Asia. The seminar he organized on Education for Environmental Competence furnished the initial impetus for this paper.

Last, but not least, fellow second language educationists involved in environmental education and other aspects of global education, especially those of Global Issues in Language Education interest section of JALT (Japan Association of Language Teachers), have provided a great source of inspiration and information. Of course, the views are my own. Readers are most warmly invited to please help my continuing education about this vital area by sharing with me their insights into the issues raised in this paper.

SECTION I

CHAPTER ONE

WHAT IS ENVIRONMENTAL EDUCATION?

> In the end we will conserve only what we love,
> We will love only what we understand,
> We will understand only what we are taught
> *Baba Dioum*
> *Senegalese Poet*

Modern History and Definition of Environmental Education

Environmental education emerged as an interdisciplinary field around 1970 in recognition of the rapidly escalating deterioration of the environment. Reflecting the world-wide character of this emergence, the United Nations held the first International Conference on the Human Environment in Stockholm, in 1972. The United Nations Environment Programme (UNEP) was founded at this conference and, together with UNESCO, it established the International Environment Education Programme (IEEP) in 1975. (Today, the IEEP publishes a quarterly newsletter, Connect, in six languages.)

The IEEP organized the International Environmental Education Workshop in Belgrade, Yugoslavia in 1975. The key result of this workshop was the Belgrade Charter, which recognized the pressing necessity of environmental education and sought to define the goals and objectives of the field. These are laid out in Parts C and D of the Charter, reproduced below:

> **C. Environmental Education Goal**
> The goal of environmental education is:
> To develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.
>
> **D. Environmental Education Objectives**
> The objectives of environmental education are:
>
> 1. **Awareness**
>
> to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems.

2. Knowledge

to help individuals and social groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it.

3. Attitude

to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement.

4. Skills

to help individuals and social groups acquire the skills for solving environmental problems.

5. Evaluation Ability

to help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors.

6. Participation

to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems.

The Tbilisi Declaration, quoted in Chapter Six of this paper, resulted from the Inter-Governmental Conference on Environmental Education, held in Tbilisi, Georgia, USSR in 1977. There, sixteen strategies were developed for furthering environmental education globally. An index of the growth of the field is that in 1981 UNESCO compiled a bibliography of works dealing with environmental education that was 61 pages long (UNESCO, 1981). Of course, today such a bibliography would be many times longer. Indeed, many a tree has fallen to provide paper for materials about saving the environment. Let us hope those trees did not fall in vain.

Today, in the 1990s, an even greater sense of urgency exists around environmental education. In 1972 environmental education was only a recommendation for the UN. At the 1992 Earth Summit, officially named the United Nations Conference on Environment and Development (UNCED), held in Rio de Janiero, Brazil, environmental education was more firmly placed on the world's agenda, calling for billions of dollars to be spent to integrate environmental education across the curriculum.

Environmental Traditions

While many of the initial environmental education efforts occurred in the developed world, many environmentalists trace the roots of environmental consciousness back thousands of years to traditional cultures and religions in the developing world. For example, Baharuddin (1993) sees a strong environmental ethic in Islam. Observing the patterns of rural life in Asian and Pacific countries, Maurice Strong, Secretary-General of UNCED 1992 stated,

> Traditional peoples are the primary custodians of most of the evolutionary experience of mankind. They still hold vital and rare wisdom based on their success at managing a sustainable environment, as their ability to exist in harmony with ecosystems such as the forest, that more 'developed' cultures are decimating, testifies (Strong, 1992, cited in de Silva, 1993, p. 14).

U.S. environmental philosopher Baird Callicott (1993) bemoans the fact that with the advent of industrial society, people have lost the concern for the environment found in preindustrial cultures. He states that many Western environmentalists were influenced by their exposure to preindustrial Eastern philosophies. For example, 19th century U.S. writers Henry David Thoreau and Ralph Waldo Emerson borrowed from Hindu thought, while 20th century nature poet Gary Snyder drew inspiration from Buddhism.

Soemarwoto (1981) describes how ecological wisdom is practised in traditional Indonesian villages. People in rural Indonesia, Soemarwoto contends, see themselves as part of the environment, not outside of it. In their belief system, there exists for humans the obligation to maintain the overall harmony of the cosmic order of which they form a part. Thus, resource use is cautiously monitored to avoid over-exploitation. Nevertheless, Soemarwoto acknowledges that these traditional societies sometimes do negatively impact the environment.

Based on the role of tradition in environmental protection, Soemarwoto makes three recommendations about environmental education.

1. Rather than assuming that people are ignorant about the environment, environmental educationists should strive to draw on people's ecological traditions.
2. For many people, culture, not scientific knowledge, holds the key to environmental understanding.
3. Local conditions must be considered.

Other Aspects of Environmental Education

While this paper focuses on curriculum design for *students* learning about the environment, environmental education encompasses efforts both in schools and with the general public. The increasing number of careers dealing with the environment presents another way that environmental education fits with education overall. Also, environmental education can take a single-subject approach or an interdisciplinary one. In a single-subject approach, students have a special course on the environment, rather than environmental themes being integrated into all courses. This paper recommends an integrated approach as the principal one for language educationists.

Teacher training forms an essential component of any environmental education effort. While language teachers do not need to be scientific experts or environmental activists, they need to be environmentally literate and responsible if they are to invite their students to become so. Teacher training hopefully includes the six elements of environmental education mentioned above: awareness, knowledge, attitude, skills, evaluation ability, and participation. Such training can go on at both the preservice and inservice phases of teachers' career, and, of course, teachers can learn from and with their students.

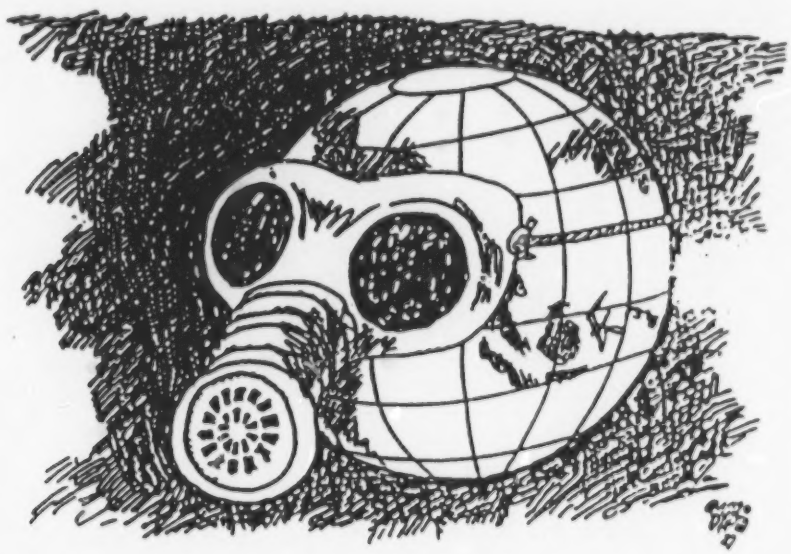
Many environmental educationists advocate that a strong ethics, or values, component be

included in education on the environment. They recommend a blending of the rational, the spiritual, and the emotional to create an environmental sensibility which appeals to the whole person (de Silva, 1993). This environmental sensibility must become a firm part of students' perspectives on life, not just knowledge they use to score well on a test and then forget. Such a sensibility is described in a statement by the International Union for the Conservation of Nature and Natural Resources (1980, cited in de Silva, 1993, p. 7):

> A new ethic, embracing plants and animals as well as people, is required for human societies to live in harmony with the natural world on which they depend for survival and well being. The long term task of environmental education is to foster or reinforce attitudes and behaviour compatible with this new ethic.

Gatto (1992) discusses one way that the hidden curriculum of school promotes environmentally unfriendly values by encouraging unnecessary consumption. Too much of our education, he believes, is telling students they had better study so they can get good jobs and earn lots of money in order to be able to buy more things. People are judged by how much they own. Education, according to Gatto, demands that students, "compulsively compete with each other and publicly labels the losers by literally de-grading them, identifying them as 'low-class' material. The bottom line for the winners is that they can buy more stuff" (p. 68)!

Environmental education receives more attention all the time. More and more educationists are devoting their creative energies to the task. As a result, a great many materials and activities are being produced for classroom use. Indeed, by merging traditional and modern themes, environmental education offers many lush green paths for educationists to follow and create.



Because of all the air pollution created, we may soon be walking around wearing gas masks.

CHAPTER TWO

ENVIRONMENTAL EDUCATION AS PART OF GLOBAL EDUCATION

The Flavour of Apathy

I am eating a bowl of ice cream
as bullets scream
around the world.
I am scooping out a big strawberry
as forest after forest
vanishes in smoke.
I am biting into another scoop
as fear and hatred
spread like germs across the earth.
I am licking my spoon after the last bite
as the vacant eyes of hungry children
force me to question:
Just how sweet is the taste of indifference?

Tim J. Newfields,
an English teacher in Japan

Environmental education is often seen as part of a wider trend usually called global education (Cates, 1990; Hanvey, 1977; Jacobs, 1990a). This trend has emerged over the past 20 years in response to the realization that in many ways, for better or worse, the world is becoming increasingly interconnected and interdependent and, at the same time, threatened by a number of severe crises. An example of this interdependence is that much of the entertainment we enjoy and many of the products we use come from across our countries' borders or even from the other side of the globe.

The Gulf War of the early 1990s showed how a conflict ostensibly involving just two neighbouring countries, Kuwait and Iraq, can mushroom into a war involving troops from all over the world and create air and water pollution which threaten human and other life throughout an entire region. Truly, there can be no doubt that what happens far away affects us at home, culturally, politically, economically, *and* environmentally.

In addition to environmental education, other areas included in different people's uses of the term global education include development education (involving issues affecting developing countries), peace education, and human rights education (Reardon, 1988). While some educationists focus only on some or one of these global education themes, there is, certainly, a great deal of overlap.

Development education links to human rights education because the fulfilment of such basic needs as food, clean water, and shelter are seen as fundamental human rights. Developmental and environmental education interface because of the issue, discussed more fully in Chapter Five, of how we can meet those basic human needs while still preserving the environment. Two ways that development and peace education connect is that war retards development, and

military spending diverts funds from development.

Environmental education overlaps with peace education because, as seen in the Gulf War, great environmental destruction accompanies military conflict. Further, funds spent on weapons and soldiers cannot be used for environmental purposes (Students, Raffles Junior College, 1991). As to environmental and human rights education, ecological deterioration has advanced to the stage where huge numbers of people's lives are endangered in the long- and even the short-term.

As professionals, we language educationists have a role to play beyond the teaching of our particular subject area. We also need to examine how our work connects with the world outside the classroom walls. An outstanding example of professionals with such an inclusive perspective is the organization International Physicians for the Prevention of Nuclear War which was awarded the Nobel Peace Prize for their efforts. These doctors looked beyond their clinics and hospitals toward a broader definition of their professional mission. They saw that all their work would be for nothing if their patients died in a nuclear war.

People from a wide range of professions have responded to this more integrated view of their callings. In the field of education, organizations abound at international, national, and local levels in which people volunteer their efforts to issues ranging across the global education spectrum. For example, in December, 1993, Suchow, China will host an international symposium whose theme will be "Education for International Understanding."

Second language educationists are no exception to this trend. Within Teachers of English to Speakers of Other Languages (TESOL), the world's largest organization of ESL professionals, moves are under way to form a global education Interest Section (Contact: Professor Anita Wenden, York College, City University of New York, Jamaica, NY 11541, USA). In Japan, ESL professionals have established the Global Issues in Language Education Network (Contact: Professor Kip Cates, Tottori University, Koyama, Tottori City 680, Japan). Teachers College of Columbia University now has a global issues course as part of their Masters degree in TESOL programme (Fanselow, 1992).

Organizations of language professionals which address global concerns have many functions, including:

1. developing materials, activities, and other resources;
2. conducting research;
3. communicating with other educationists via newsletters, books, conference presentations, and workshops;
4. including global education in teacher training curricula; and,
5. liaising with similar organizations in education and other professions.

A central theme of environmental education focuses on looking around us, on not fixing only on what lies immediately before us in space or time. In today's increasingly interconnected and interdependent world, we language education professionals must see our task not mainly as one of preparing students to pass examinations, but more importantly as a process of preparing students for citizenship in their communities, nations, regions, and in the world.

CHAPTER THREE

THE WORLD-WIDE DEVELOPMENT AND INTEGRATION OF ENVIRONMENTAL EDUCATION

Across the curriculum, across grade levels, and across the world, environmental education is being integrated into the curriculum. Examples abound. For instance, environmental journalism is becoming part of the curricula at mass communication and journalism education institutions in Southeast Asia. The School of Mass Communications, Mara Institute of Teknology in Malaysia has instituted an Environmental Communication course. The College of Mass Communication, University of the Philippines in Diliman, and the Institute of Development Communication, University of the Philippines at Los Banos have integrated environmental reporting in their media writing courses (Valbuena, 1993).

In Vietnam, Le (1993) reports that Environmental Education programmes exist from preschool to technical, vocational, and university levels. These include Environmental Engineering courses at the Universities of Technology in Hanoi and Ho Chi Minh City. Beyond the school walls, teachers and students take environmental campaigns to the general public.

In Singapore, environmental themes have been included in the new English coursebooks at the primary level, and plans are under way to include them in the secondary coursebooks as well. Students also take part in keeping their school grounds green and clean.

In Australia, a new secondary school curriculum looks at the relation between society and environment (Secondary Education Authority of Western Australia, 1992). This integrated syllabus links values related to ecologically sustainable development with values related to cultural awareness, social justice and democratic process (de Silva, 1993).

As mentioned in Chapter Two on the connection between global education and environmental education, more and more educationists are working together to think about how they can help with the environmental and other global issues. Two separate journals with the same name, Green Teacher, one published in Canada and the other in Wales, cover topics in environmental and global education. (Contact: Green Teacher, 95 Robert St., Toronto, Ontario, CANADA M5S 2K5 or Green Teacher, Machynlleth, Powys SY20 8DN Wales, UK.) Similarly, more and more presentations and workshops on environmental education are taking place at conferences for second language educationists. At one recent conference, there was a presentation entitled, "ESL: Earth Saving Language" (Hockman, Lee-Fong, & Lew, 1991). Other conferences have featured workshops on, "50 simple things you can do to teach environmental awareness and action in your English language classroom" (Brown, 1991) and, "TEFL: Teaching Environmentally Friendly Language" (Ushimaru, 1992).

How much coverage do current second language textbooks give to environmental education? In the only study of this matter which I have seen, Nakabachi (1991) looked at 48 textbooks for English instruction approved by Japan's Ministry of Education for use in secondary schools. He found that 62.5% of the textbooks for teaching English included environmental themes. Of the total of 752 lessons in the 48 textbooks, 6.5% dealt with the environment. The most common environmental themes were protection of animals, desertification, deforestation,

pollution, and garbage.

A look at publishers' catalogues reveals more and more books and videos helping students learn about the environment at the same time as they learn their new language. Further, as Nakabachi found in Japan, it is now common generally for second language textbooks to have a chapter or activity concerning the environment. For example, in a book of cloze passages on various themes, Jacobs and Power (1991) include passages on Chico Mendes, a Brazilian who was killed for his defense of rainforests and of the people who work in them, on the struggle of women in Burkino Faso to obtain clean drinking water, and on the decision-making process of a town as it weighs the pros and cons of allowing a factory to be built. Governments, international bodies, and environmental groups also produce a wide range of classroom materials.

Particularly striking is the bountiful crop of new books for people learning English with content focused entirely on the environment. Some of the titles are Our Precious Earth (Cunningham, 1992), Save Our Planet (Knudsen, 1991), Where on Earth Are We Going? (Porritt, 1993), Another Green World (Lander, 1993), and The Student Environmental Action Guide (Earth Works, 1993). The latter work deserves particular mention as it was written by ESL university students in Japan to be read and used by their peers. The book, printed on recycled paper, supplies background information, success stories, and action ideas for 20 campus environmental topics. Videos with accompanying activities for ESL students are also available (e.g., Stempleski, 1992).

Last, but definitely not least, as the Japanese students have shown, students and teachers are not waiting for publishers and others to do it for them. On their own, they are bringing to the classroom their concerns about creating a sustainable environment. This takes place in many ways in all the traditional skill areas. Yes, no one can doubt that environmental education has won a deserved place in the content side of the education curriculum. Section Two of this paper, beginning with Chapter Six, examines suggestions for classroom methodology which may fit well with the goals of environmental education.

Some places used to put up "No Fishing" signs to preserve wildlife, but now pollution from factories and other sources has killed all the fish in many places.

CHAPTER FOUR

A BRIEF GLOSSARY OF ENVIRONMENTAL TERMS

> "We were making the future," he said, "and hardly any of us troubled to think what future we were making. And here it is!"
>
> - *H.G. Wells, The Sleeper Awakes*

We do not need degrees in chemistry or botany to integrate environmental education into our language classes. Nevertheless, it is helpful to have some basic knowledge of terms which commonly appear in writing about the environment. For that reason, this brief glossary has been prepared with help from two of the many recent books about the environment written especially for the lay reader (Lau, 1991; Lim, 1992). Terms which appear in italics in the definitions are themselves defined elsewhere in the glossary.

Acid Rain

Rain which contains pollutants, such as sulphur dioxide and nitrogen oxide. It is more acidic (pH 3.0) than normal rain (pH 5.6). These pollutants enter the atmosphere in the first place from the burning of *fossil fuels*.

Acid rain kills plants and animals and poisons lakes and other bodies of water. It has also caused damage to famous buildings, such as the Taj Mahal. Acid rain is an international problem. Sometimes it falls more than a thousand kilometres from where the *fossil fuels* were burned.

Thus, acid rain powerfully illustrates the principle that the entire earth is one integrated ecosystem. What happens in one place affects the entire system. We may think that our garbage and pollution just blows away, is buried, or washes away, but in reality it lives on to cause problems in some other time or at some other place.

Appropriate Technology

Technology which uses less energy, does less damage to the environment, and is better suited to the particular conditions of the place it is being used and the people who are using it. One example is the use of solar energy to heat water in countries with large amounts of sunlight.

Biodegradable Items

Items which break down naturally in a fairly short time. An orange skin is an example of a biodegradable item. Nonbiodegradable items, such as plastics, may take hundreds of years to decompose. Even biodegradable items can do damage to the environment if not disposed of properly.

Biodiversity

The range of plant and animal species and habitats that exist in an area. Human intervention has greatly reduced the biodiversity in many areas.

Chlorofluorocarbons (CFCs)

The human-made chemicals that are believed to be the main culprits in the depletion of the ozone layer. CFCs are used as propellants in aerosol cans, as coolants in air conditioners and refrigerators, and in styrofoam and polystyrene containers for fast foods and other products. International agreements have been made to greatly decrease the future use of CFCs, but progress in reducing CFCs is slow.

Ecolabelling

The labelling of products to indicate they have a less harmful impact on the environment. An example of ecolabelling is the putting of a recycled symbol on a package of recycled paper. Unfortunately, just because manufacturers label their products as environmental friendly does not mean that they really are. Ecolabelling is also used to help recycling. For example, some plastic products are labelled as to what type of plastic they contain so that they can be sorted properly when being recycled.

Ecotourism

Using nature as a tourist attraction, but doing it in such a way that the minimum possible harm is done. An example of ecotourism is to promote hiking in nature reserves. This can help increase people's knowledge and appreciation of the environment. However, some people worry that any human contact will disrupt nature.

Fossil Fuels

Fuels derived from the fossilized remains of plants and animals. Coal, natural gas, and petroleum are widely burned fossil fuels. Kerosene, petrol (gasoline), and diesel fuel are among the byproducts of petroleum. Fossil fuels are finite sources of energy. Once used, they take millions of years to replace.

Global Warming

The warming of the earth's atmosphere brought about by the *Greenhouse Effect*. Global warming is the accelerating human-made increase in temperatures. While not all scientists agree, many say that the 1980s was the hottest decade in recorded history. According to their predictions, a continued rise in temperatures will lead to flooding in low-lying areas, droughts, and other climatic catastrophes.

Greenhouse Effect

The phenomenon that too much heat is being trapped inside the earth's atmosphere. After heat from the sun enters the earth's atmosphere, carbon dioxide and other gases help keep the earth warm by stopping a portion of that heat from escaping. These are called greenhouse gases because, just like the glass of a greenhouse, they allow sunlight and heat to enter but stop some of it from escaping. Unfortunately, due to modern machines, such as cars, the amount of greenhouse gases in the atmosphere is increasing. Thus, too much heat is being trapped. The result, according so some, but not all, scientists is *global warming*.

Ozone Layer

A layer in the atmosphere which shields life on earth from ultraviolet radiation from the sun. Evidence suggests that the ozone layer is thinning dangerously. Increased exposure to ultraviolet radiation can cause skin cancer and eye cataracts among humans and other animals and may reduce crop harvests. The main cause for the thinning of the ozone layer

is believed to be *Chlorofluorocarbons (CFCs).*

Precycle

Reducing the amount that we use, even of materials that can be recycled. For example, if we carry a canvas or cloth bag with us when we go shopping, we do not need to get a paper or plastic bag from the store to carry our purchases home.

Primary Forests

Forests which have never been cut down. Primary forests have a greater diversity of species than do secondary forests.

Renewable Energy

Energy sources which will not run out. Energy from the sun, the wind, and from tides are examples of renewable energy. Petroleum, coal, and wood are nonrenewable energy sources.

Secondary Forests

Forests which have grown back after being cut down. These forests have less species diversity than do *primary forests*. Thus, when a forest is cut down, even if it is replanted (reforestation), it will never grow back the same.

Sustainable Development

Using natural resources to provide better living conditions for poor people without doing too much damage to the environment. *Appropriate technology* can play a big role in this.

Many trees are cut down to make disposable wooden chopsticks

CHAPTER 5

CONTROVERSIES IN ENVIRONMENTAL PROTECTION

As in every other form of human effort, endeavours to protect the environment are fraught with disagreement over the proper path to take. Educationists need to know about these controversies in order to interpret what we read and hear about the environment, consider our own views, and to help our students develop their own opinions. Three of these controversies are discussed below. They are:

1 Are we attempting to save the environment to help people only, or are we saving it for its own sake, regardless of the effect on humans?
2 Are individuals the cause of our environmental problems, or does the blame mainly lie with big corporations and governments?
3 Where should conservation efforts be focused, in the developed, Northern countries, or in the developing, Southern countries?

With each of these controversies, there are more than just two possible opinions; these are not either/or issues, but more like continua with a range of possible perspectives.

Saving What and Why?

> This whole world, make it a better place
> For you and for me and the entire human race
> *Michael Jackson, "Heal The World"*

The first controversy gets at why we want to protect the environment. Those with an ecocentric view see saving plants and other animals to be at least as important as saving people. Humans are not seen as basically different from or superior to the other animals and plants. In the words of environmental philosopher Baird Callicott:

> From an evolutionary point of view, homo sapiens is a part of nature, not set apart from it. We are literally kin to all other forms of life. With them we share the Earth, which we now know to be a small and precious planet, like a tropical island paradise in an otherwise desert ocean (1993, p. 17).

Instead of humans being apart from our cohabitants of the earth, all of nature, human and non-human, is seen by ecocentrics as inseparable. Non-human beings have intrinsic value and inherent worth, regardless of whether they have the extrinsic value of being useful to humans (Hallen, 1993).

On the other hand, those with an anthropocentric view want to save the environment because without it people cannot live or at least cannot live what they see as a full life. Polluted air poisons our lungs; harmful chemicals in our foods breed many types of cancer. The words of the Michael Jackson song above seem to reflect an anthropocentric perspective. We need to fix up the world to make it safer for and more useful to humans.

Finding the right balance between helping humans and protecting the environment poses a very difficult problem im many people's minds. Prabhakar (1981, p. 101), writing about Malaysia, captures this dilemma well:

> In developing countries, socio-economic development to meet the rising expectations of the population cannot be reversed. Where natural resources are plentiful, as in Malaysia, it is inevitable that such development will be at the expense of these resources. Yet it does not necessarily follow that socio-economic development must go hand-in-hand with degradation of the environment. With good management and the appropriate technology, the exploitation of natural resources can be controlled and disaster averted.

We see this controversy in many ways. An example would be when a hydroelectric project will help produce jobs and services for people but may wipe out an endangered species that has no known value for humans, should the project be dropped just to save that species, even though, at least in the short term, people will have fewer jobs, electric power, etc.?

This issue can also be seen in the reasons people give for protecting the environment. For instance, do they urge that the rainforest be protected because plants there may provide valuable medicines for humans or may serve the development of enhanced food crops? Or do they urge us to share the world with other species, saying that other animals and plants have as much right to live on the earth as we humans do?

Who Is To Blame - #1

A second controversy explores the roots of our environmental predicament and its solutions. According to those at one end of this continuum, large corporations and governments have brought about the environmental destruction which threatens the health and welfare of ordinary people who have little or no control over what happens to the environment. Thus, the only way to solve our problems is to educate, pressure, or change these corporations and governments.

Those at the opposite end of this continuum believe that individuals, each of us, are causing the problem through our personal misuse of the environment by, for example, driving cars instead of walking or bicycling or by having children who, in turn, continue to use up resources after we are gone. Only by changing our personal habits can the planet be saved.

This controversy comes to the fore when solutions to the environmental crisis are discussed. Should we encourage everyone to stop using throwaway plates and utensils, or, on the other hand, should we focus our efforts on calling on the government to ban them or companies to stop producing them and using them in their fast food restaurant chains, such as McDonalds? Are rainforests chopped and burned down to use for farmland because people have too many children and, thus, have nowhere else to live, or are poor people forced into the rainforests because of an unjust social system? These are just a few of the issues raised.

Who Is To Blame - #2

"An ever-increasing volume of goods and services are being produced, the majority of which are channelled toward filling the consumption demands of a minority, leaving the basic human needs of the poorer majority unmet" (Soto, 1992: pp. 17-18).

A third source of controversy connects with the two mentioned above. This debate centres on who should bear the main burden for protecting the environment, the South or the North (Soto, 1992). The South constitutes those countries which are mainly rural and less industrialized. These are mostly near or south of the equator, thus, the name South. The North is composed of the industrialized, developed countries which mostly lie north of the equator.

In the environmental debate, governments in the North focus on preserving large areas of unused land, such as the rainforests, in the South for the benefit of the entire planet now and for generations to come. They stress equity between generations. Their concerns centre on global, not local, environmental issues. In contrast, governments in the South are concerned with equity within generations between people in different countries. They say that the Northern countries achieved their higher standard of living by depleting their own natural resources, such as their forests. Now, how can they try to tell the Southern countries not to do the same?

UN surveys find a similar split between people in North and South countries as exists between their governments, with Southerners more concerned about local environmental issues and Northerners more focused on global concerns (UNEP, 1991, cited in Savage, 1993). Another contrast between South and North views is that for many people in the North, rural areas are seen as beautiful, calm, pleasant places to which people from the cities go to escape from the stresses of city living (Savage, 1993). However, to many in the South, rural areas evoke an opposite reaction, being seen as places of poverty, backwardness, and boredom. Thus, the great exodus in developing countries from rural to urban areas.

To Southern governments, the environmental and developmental crises constitute a single social-ecological crisis. One cannot be solved without the other. As Savage puts it:

> I see no reason nor have any apologies for Third World countries taking an anthropocentric view of their ecological issue especially when people in developing countries are living on the main stay of malnutrition, poverty, unemployment, hunger, starvation, ... Like other biological organisms, the human species here is also endangered (1993, p. 13).

Is it fair for Northern governments to ask the South to stand still developmentally, when the North is so far ahead? The average income of the richest one billion of the world's more than 5.5 billion people is 20 times larger than that of the poorest one billion (Soto, 1992). Should the North become less developed, the South more, or is sustainable development possible, i.e., development that exists in harmony with nature?

The South says the North is overdeveloped. While many Southern countries have economic debts to Northern countries, the Northern countries are seen as having environmental debts to the rest of the world because they use such a large share of the earth's resources. Further, Northern countries aggressively try to export their consumption values to the South in order to get them to buy exports from the North, such as cars and cigarettes.

We see this controversy in many forms. For example, the famous 1992 Earth Summit in Rio de Janiero, Brazil was entitled the United Nations Conference on Environment and Development. Instead of focusing solely on the environment, delegates from Southern and Northern governments, as well as from nongovernmental organizations (NGOs), clashed there over how much emphasis to put on development in the South.

In summary, the more we know about the environment, the better we are at including environmental concerns in our classrooms. Thinking about where we stand on these and other environmental controversies or at least being aware of them helps us think about what kinds of materials and perspectives we need to include in our classrooms. Further, environmental controversies provide the basis for many potential classroom activities, as students investigate and debate these vital issues. Activity Two in Section Three of this paper is an example of such an activity.

Governments in developed countries often urge poorer countries to stop development in order to protect the environment. For example, trees help take carbon dioxide from the air, thus inhibiting the greenhouse effect. However, cars and other machines so common in developed countries are the major causes of the greenhouse effect. Amigo is the Spanish word for friend.

SECTION II

CHAPTER SIX

THE PSYCHOLOGICAL AND LINGUISTIC FOUNDATIONS OF METHODS FOR INTEGRATING LANGUAGE EDUCATION AND ENVIRONMENTAL EDUCATION

> By its very nature, environmental education can make a powerful contribution to the renovation of the education process
>
> *United Nations, Tiblisi Declaration (1977)*

Two Paradigms For Viewing The Environment And Education

The main theme of this chapter is that many commonalities exist between views of the environment and views of educational theory. Four of these commonalities are considered. The four commonalities can be classified according to how they fit into two paradigms, which, for our purposes here, are labelled Paradigm A and Paradigm B. It is suggested that the perceptions embodied in Paradigm A contribute to environmental destruction and unsound pedagogical practice, while Paradigm B is more consistent with protection and promotion of nature and with sound educational practice.

The perspectives of the two paradigms as they relate to the environment and to education are first listed (Table 1) and then discussed. This is followed by a discussion of the roots of these two paradigms especially as they relate to second language pedagogy.

TABLE 1

Commonalities Between Beliefs About the Environment and About Education

	Paradigm A	Paradigm B
Nature and Students	1. Passive, Blank, Need to be Controlled	Active, Flourishing, Independent
	2. Diversity Ignored or Abolished	Diversity Recognized and Encouraged
Nature and Knowledge	3. Isolated, Compartmentalized	Contextualized, Integrated
Key Concern	4. Outcome, Product, Quantity	Process, Quality

Commonality One - Passive and Blank or Active and Flourishing

People who view nature and students from the perspective of Paradigm A see both as passive and blank entities which need to be controlled by outside forces. In nature, we hear this outlook reflected in the use of terms such as "raw materials," "untapped resources," "vacant land," and "untamed animals." Without the human hand to shape it, nature has no purpose. If people are not using nature, it is being wasted.

This perspective hurts the environment because it encourages and condones the destruction and disruption of natural habitats. Preserving nature, keeping humans out of designated areas or, at least, limiting their impact is seen as wasting potential resources. Progress, dynamism, and modernity are represented by the human-made, while preservation connotes backwardness, sloth, and obsolescence.

Similarly, in Paradigm A students are seen as blank slates. Students' knowledge and behaviours come from their teachers, who shape and tame them. Teachers are the responsible, active ones, while pupils cannot be trusted with responsibility and must be kept under control, like wild animals. Students are to sit in their classroom passively receiving what the educational system decides they need to know and think; they have no voice as to what, when, where, or how they will learn and are not told why. Control of the learning process thus rests with the school, not the learners.

In contrast, those who see nature from the perspective of Paradigm B believe it has value in its own right. They appreciate that nature is active and flourishing on its own, whether or not humans interact with it. They see limits to the extent to which humans can, should, or would want to control nature. People with this perspective seek ways to maintain nature as it is and, where possible, attempt to restore nature to its prehuman state. This can take many forms, such as designating areas where no humans are allowed, areas where people can go but no tampering with the environment is allowed, and areas where economic activity is permitted but highly restricted.

In the same way, students, viewed from the lens of Paradigm B, come to the classroom not blank, but already equipped with knowledge, interests, experiences, and needs, all of which should be taken into account in the educational process. Rather than passively receiving knowledge from teachers and books, students actively select and construct their own learning. Giving students some control of their own education both recognizes reality and fosters motivation for ongoing learning.

This way of viewing the educational process manifests itself in many ways. For example, students are often encouraged to choose their own topics for reading and writing. Working in groups with other students is another way of enabling pupils to exert control. Also, the use of questions with more than one possible right answer provides a means of encouraging students to exercise their own voices, rather than merely parroting back what the teacher and the textbook have told them.

Commonality Two - Diversity: Good or Bad?

Nature is incredibly diverse, coming in a seemingly endless array of colours, shapes, and sizes. Similarly, each student is a unique human being. Unfortunately, those who view the environment and education from the perspective of Paradigm A often ignore or seek to constrain

this diversity. As to the environment, diversity is ignored when there is no recognition that different plants and animals have a unique role to play in maintaining harmony in the environment. Biodiversity is destroyed when human intervention wipes out species of plants and animals. There are many examples of this disdain for natural diversity. Forests full of diverse species are cut down and replaced with fields dominated by one cash crop only. As a result, not just the trees, but all the plants and animals in the forest, are adversely affected. Due to human interference in the environment, countless species have become extinct and countless more are threatened.

A similar attitude exists within Paradigm A as to students. A one-size-fits-all approach ignores the great diversity among students in terms of background, interests, learning styles, and needs. Students who do not learn well in the dominant teaching mode either adapt or are labelled as misfits and failures. Less powerful cultures are subordinated to dominant ones. For example, many students, especially from certain cultures, prefer to learn via cooperative interaction with their peers. However, the dominant mode of teaching isolates students from one another, stressing competition and individual effort over collaboration. In reality, students need a diverse learning environment in which they experience learning in many contexts. Another example of the lack of diversity in education is that to measure achievement and competence, questions are used which have only one right answer.

On the other hand, from the perspective of Paradigm B, diversity in nature and among students is recognized and encouraged. Natural diversity is seen as essential for preserving the balance in any given habitat. Thus, efforts are made to sustain it. We see this respect for natural diversity in the way some people are trying to protect endangered plant and animal species, even when that involves limiting or redirecting economic activity. People are realizing that diversity is essential for maintaining the ecological balance, that removing one part of the web of life impoverishes and imperils all that remain.

Educationists can also respect and encourage diversity among students. Such an approach involves providing opportunities for students to try different ways of learning and recognizing that not everyone learns in the same way. There is less emphasis on questions with only one right answer obtained via one prescribed route and more emphasis on questions that admit to several possibilities, thus encouraging diverse thinking.

From a Paradigm B perspective, diversity enriches and enlivens classrooms. Diversity is encouraged by helping students learn about different countries, languages, and cultures, as well as by understanding that the way humans live has changed and will continue to change. For example, people have lived more harmoniously with nature in the past and can do so again in the future. Students need to see that while change is inevitable, we can try to effect this change so that it benefits people and the environment.

Commonality Three - Isolation or Integration

In Paradigm A, both nature and knowledge are compartmentalized, treated as isolated units. Connections are ignored. A well-known example of viewing nature in isolated components is the spraying of pesticides on food plants to kill insects. The insect population is usually reduced, at least temporarily, so the one, isolated goal of lowering crop loss due to insects is achieved. However, birds and other animals are inadvertently also killed. Additionally, the pesticides poison the people who spray them on the plants, as well as nearby sources of water. Thus, viewed as a whole, pesticides, while temporarily effective in achieving their isolated objective, may not be the

best course to take.

The same lessons can be applied to education. Too often, the knowledge presented in schools is compartmentalized. Pupils study one subject for 50 minutes, close their books, and go to another class where they open a different book and study a different subject. Connections are ignored and even avoided. Further, the school itself is separated off from the world outside, both in terms of content and in terms of educationists' understanding of how students' approach to education is affected by their lives beyond school.

Contrastingly, people influenced by Paradigm B see nature and knowledge as integrated wholes. The environment is seen as a web of life, with each diverse component necessary to the survival of the others. Thus, removing or introducing species can have a profound effect on the entire environmental system of an area. An example of the benefits of integration in the environment comes from the use of planting several different crops on marginal land in India. Each crop contributes to the overall welfare by warding off insects, putting nutrients into the soil, or retaining moisture. Therefore, together they succeed better than each would alone.

In education, the emphasis of a Paradigm B approach lies in integrating knowledge, in helping students see the connections. An example is the concept of writing across the curriculum. Writing no longer falls exclusively into the domain of the language teacher. Instead, students use writing as a tool for thinking and communication in all their classes. Another aspect of this integration involves linking school activities to students' worlds outside school.

Learning about the environment provides an excellent opportunity for integration because the broad scope of the issues - from scientific to sociological - means that every subject area can be involved. For instance, an integrated curriculum unit on the theme of sharks could include a short story about human encounters with sharks, a biology lesson on how sharks differ from other large marine animals, mathematics exercises using information about shark populations, and a social studies focus on how governments should deal with shark encounters with humans.

Commonality Four - Product and Quantity or Process and Quality?

The key concern of people with a Paradigm A outlook, regarding the environment or education, resides in the product. For instance, with the environment, they want to know how much food is produced or how much profit is made. The outcome is more important than the process by which the product is obtained. For example, building lots of cars may be more profitable than improving public transport, but the process of using the cars generates much more pollution than would be created were public transport used.

In the classroom, this same product approach concentrates on *what* the answer is or *what* the score is on a test instead of on *how* the answer was obtained or *how* the process of studying for the test helps students become better learners. The result is a very exam-oriented school where inordinate value is placed on those aspects of education which can be measured on an exam, while ignoring equally or even more valuable information about students, such as their ability to apply what they learn to real-life situations or their willingness to investigate issues on their own.

On the other hand, from a Paradigm B perspective, process and quality are more important than product and quality. In terms of the environment, such an emphasis is seen, for instance, in the use of smaller scale technology which may not have the same economy of scale but is more

appropriate to the setting in which it is being used and does less damage to the environment. In this way, how something is produced receives more importance than how much is produced.

In education, this focus on process and quality aids learning in many ways. Focusing on the process encourages educationists and students to explore what is happening in students' minds as they involve themselves in learning tasks. Students can learn, and share with others, more effective strategies and techniques. An emphasis on process and quality also fosters a more long-term view of education, one that seeks to prepare students not just for the next big exam, but to function as active, thinking, concerned adults.

Roots Of The Two Paradigms

This next segment considers the roots of the two paradigms. However, one qualification needs to be made before continuing. None of the above intends to imply that people whose views on the environment are more closely aligned with Paradigm A are uncaring nature haters whose idea of utopia is a treeless, artificial environment in which nonhuman animals only exist in zoos, on tv, and in plastic replicas. Indeed, those holding views consistent with Paradigm A continue to contribute to possible solutions to environmental problems, such as alternatives to the use of fossil fuels. The point, following Kuhn's (1970) description of the way working within a given paradigm limits how we see the world, is that Paradigm A has often blinded people to the consequences of their actions and sealed their hearts from the cries of the nonhuman world.

Similarly, in the educational arena, many dedicated educationists hold to Paradigm A views of learning, and these ideas do provide valuable insights into the learning process. Again, the point here is that as an overall motivating approach to education for the 21st century, such notions prevent students from reaching their full potential. Part of that potential involves their ability and willingness to preserve the environment.

Positivism

Positivist philosophy can be found at the foundation of many of the ideas in Paradigm A. One of the founders of positivism was the seventeenth century philosopher Francis Bacon, a pioneer of the scientific method. Bacon sought to discover inviolable, universal, fundamental laws. These laws were to be acontextual; they would apply regardless of setting. In Bacon's method, nature is studied piece-by-piece, in isolated parts, context is controlled, and contextual relations are unimportant because universal laws have been discovered (Balasubramaniam, 1993). Analysis, not synthesis, is the key. The whole is no more than the sum of its parts.

Bacon warned that in order not to jeopardize scientific understanding, strict reliance must be placed on what can be observed. The observer stands apart and is separate from the observed in order to gather objective data. Nothing else but these concrete data must be used in formulating laws. By understanding these laws, people make nature subservient to them. Positivists see nature as a blank canvas, an unshapen piece of clay, and humans, armed with scientific knowledge, as the painters and the sculptors.

Behaviourist Psychology

Behaviourist psychology (Skinner, 1953) represents the application of the positivist perspective to the mind. Let us examine how it is applied to education specifically. Universal

laws are sought which work the same for humans as for rats, the same for infants as for adults, the same for students in classes of 50 in poor, rural areas as for classes of 15 in wealthy, urban areas. There is no need to adjust instruction to students' specific backgrounds, interests, abilities, or styles of learning. Thus, there is one right way to teach, one right way to learn, and one right answer for every question. Uniformity and conformity are stressed throughout.

Just as their counterparts in the physical sciences see nature as a blank slate waiting to be written upon by humans, so too do behaviourists see students as empty buckets waiting for educationists to pour knowledge into them. The teachers and materials writers are the authoritative, directive, creative ingredients, while the students are ignorant, receptive, and obedient. The students have no input into what is studied, how fast they cover material, or how their classwork is structured. Interaction between learners is discouraged because bad habits may result. Interaction is strictly between teacher and learners, not learner and learner.

People, in the behaviourist view, are not free agents in control of their own destiny. Given this, educationists' duty lies in properly moulding students as society sees fit. Learning originates in teachers who drill students to form correct habits, with the teacher rewarding students for successful imitation of the model. The more frequently a habit is repeated, the stronger it becomes, and the greater the learning. Understanding is not necessary. Students' opinions and feelings are not sought, because such an open-ended response format might produce errors which would impede the formation of correct habits.

Following Bacon's method, behaviourists break knowledge into small, isolated elements and believe that education progresses most smoothly when students receive information in small, step-by-step bits. Each bit is isolated from those around it so as to avoid confusing the students. In the same way, the curriculum is compartmentalized; each subject receives separate treatment. Knowledge is specialised into isolated compartments, e.g., history, science, language. Attempting to make connections between compartments would probably only hinder learning.

Behaviourism grew up partly as a rejection of approaches to psychology which speculated about what was happening inside the mind. True to positivist philosophy, behaviourists focus strictly on what is concrete, observable, and measurable. They are interested only in what people do; the underlying processes are unobservable and abstract and, thus, beyond the realm of objective science. This focus on the product, the observable behaviour, rather than on the process which leads to the behaviour, has important educational implications. Instead of teaching students how to do something, instead of looking at how students' attempts represent steps toward understanding, the emphasis lies in judging whether students produce the correct answer.

Structural Linguistics

In linguistics (the study of language), structural linguistics (Bloomfield, 1933) took up the positivist mantle. Structural linguists see languages as hierarchically organized. They seek to describe languages by breaking them down into their smallest parts, analyzing each separately, isolated from its meaning. For example, sentences are broken down into words, which are broken down into parts. These word parts are, in turn, broken down into sounds. Reacting against the mentalist approach to linguistics of the traditional grammarians, structuralists study only the language which people produce, believing that what underlies this production is beyond the scope of objective investigation.

Structural linguistics, combined with behaviourism and applied to language learning often means drills on the basic elements of language, taking one feature at a time, mastering it by way of repeated rote practice, and then moving on to the next feature. The language of the drills is often artificial and presented without context or without a purpose beyond that of learning the language. For example, in language instruction derived from behaviourism and structuralism the syntax of a language is studied one tense at a time. First, students master the present tense, speaking, hearing, reading, and writing only present tense sentences, regardless of how artificial this might be. Then, they go on to another tense. Structuralist language teaching emphasizes the form of the language, not the meaning, because form is seen as more objective, while meaning is more subjective.

Alternatives - Roots Of Paradigm B

The second half of the 20th century is witnessing a rising tide of rejection of positivism and its linguistic, educational, and environmental implications. In psychology, cognitivism (Ausubel, Novak, & Hanesian, 1978; Bruner, 1966; & Piaget, 1926) and humanism (Maslow, 1970; Rogers, 1969) emphasize what underlies behaviour and in education see the roles of learner and teacher very differently than do the behaviourists. In the behaviourist view, learners resemble mechanical robots to be assembled by educationists and programmed to perform appropriately. An analogy derived from cognitive and humanistic views would be learner as plant. The plant grows based on its own design, but needs soil, sunlight, and water to thrive. Guided by this analogy, educationists value students' present knowledge and interests, rather than denying and neglecting them as do the behaviourists.

Cognitive Psychology

Cognitive psychology pays particular attention to how we select, remember, organize, and use information. A key concept for cognitivists is that we select what we will learn based on our interests and present knowledge, and we remember new information by connecting it to our prior knowledge. Thus, meaningful, not rote, learning takes centre stage. Another implication of cognitivism is that every learner is different based on their different traits and past experiences.

Cognitive psychology, in particular, serves well in reminding us of the importance of context in learning. Researchers have shown how our comprehension breaks down when we lack the context necessary to understanding. For example, Carrell's studies (e.g., 1983) suggest that second language students may fail to understand texts not because of lack of knowledge about the vocabulary and grammar of the target language, but because of insufficient background knowledge of the culture in which the text is situated.

Correspondingly, lack of recognition of the importance of the environmental context has many times led to environmental destruction. For instance, governments and companies intent on development often import an animal, plant, or technology which proves ill-suited to the culture, either natural or human, of its new surroundings. The result frequently proves destructive to the environment.

Humanistic Psychology

Humanistic psychology motivates many of the same implications as does cognitive

psychology. Humanists believe that each person is unique. The purpose of education exists in allowing students to develop their potential in light of this uniqueness. Creativity and other forms of complex thinking are encouraged.

The affective element in learning receives emphasis from humanists who favour a warm, democratic atmosphere in the classroom, with the teacher as experienced, knowledgable fellow learner rather than authoritarian figure. Students are encouraged to learn from one another and to develop collaborative skills and attitudes. Teachers are urged not to separate themselves and stand above students, like an objective scientist working with laboratory rats. Instead, teachers should share their experiences, work, and feelings with students, participating along with them in the joy of learning.

Biological And Educational Diversity

The environmental concepts of biodiversity and appropriate technology focus attention on the beauty of variety and the danger of trying to fit the environment everywhere into a single mould. Similarly, educationists influenced by cognitive and humanistic perspectives seek to avoid the way of Procrustes, the mythological Greek giant who would force travellers to fit the iron beds of his inn by either stretching them or cutting their limbs.

One form of diversity in education is that different styles of learning have been identified, such as extroversion/introversion, tolerance/intolerance of ambiguity, reflectivity/impulsivity, and field dependence/independence (Brown, 1987). Cognitive psychologist Howard Gardner (1983) has highlighting another form of diversity among students. He believes that many types of intelligence exist and that sound education includes all of these. He suggests that in addition to verbal/linguistic and logical/mathematical intelligence, which are usually focused on in education, there are also spatial, musical, kinaesthetic, interpersonal, and intrapersonal intelligences. To invite students to develop to their fullest potential, Gardner advocates that the use and enhancement of all these intelligences should be encouraged.

Process More Important Than Product

How to think, rather than what to think, receives the emphasis from educationists influenced by cognitivism and humanism. In other words, the process receives more attention than the short-term product of students' efforts. Such an emphasis takes on increased importance in today's information age in which knowledge rapidly goes outdated. Indeed, many entirely new occupations are being created in fields such as telecommunications. Thus, the key lies not in what we know, but in how fast we can learn new information and skills and how well we can think about the problems faced in our new tasks.

The emphasis on process over product shows up again and again in environmental issues and in educational ones as well. For example, whereas before people thought only of what was the fastest way to get somewhere, today people also consider how they get there and its effect on the environment. Walking, bicycling, or taking public transport may take longer, but they are more environmentally friendly.

Similarly, in education, research and teaching methods more and more focus on the process by which learning occurs. An example is research and methods in writing instruction (Atwell, 1987; Zamel, 1983). Whereas previously instruction centred on the final product that students

generated, now, while that remains important, a majority of time gets spent on helping students gain insight into the recursive phases of the writing process.

Generative Linguistics

Generative linguistics was launched as a direct repudiation of behaviourist psychology and structural linguistics (Chomsky, 1968). Just as in Paradigm B nature is not seen as vacant and unused without human intervention, the human mind, according to generative linguists, is not a blank slate waiting to be filled with language from the outside. Instead, we possess an innate ability for acquiring language which we use to process input. Language is not acquired through imitation and repetition of what has been previously heard or read. Instead, learners generate language via creative application of their capacities and knowledge.

Generative linguistics sees a creative role for learners, who are not just learning the patterns of the language by force of habit. Thus, language educationists influenced by this school of linguistics avoid drills and other forms of rote learning and favour language learning activities which allow students opportunities for creativity. Perfect practice is not emphasized, so all kinds of questions can be used, not just those with a single right answer. As a result, room exists for students to express their opinions.

Functional Linguistics

Functional linguistics (Halliday, 1982) also looks at language differently than does structural linguistics. Meaning is central, not form. Just as in Paradigm B the environment is seen as one integrated web of life, for functionalists language is seen contextually. This context includes the who, what, when, where, and why of the situation in which the language is used. Language use always has a purpose.

Language educationists influenced by this functionalist perspective believe materials and activities should reflect situations of relevance to students. This is consistent with both cognitive and humanistic views. Most language education experts now hold a view which emphasises helping students develop communicative competence (Yalden, 1981) in the language. Just knowing the target language grammar and vocabulary is not enough. Learning a language means learning to communicate with the language, not just learning the various sounds, words, and other components of the language.

Learners need to be capable of applying what they know to negotiate meaning when they interact in oral or written modes. Interaction occurs not only between teacher and students but also among students. Such interaction can encourage cooperative relationships among students. Also, it is recognized that many forms can be used to express a similar meaning; there is not just one right way.

Another influence of functional linguistics flows from its concept of language being used to do something. From that has come the idea of linking language teaching to a task-based syllabus. The idea is that language is best learned when activities are structured around goals, so that students acquire the language in the process of achieving their goals. "Significant language skills ... can be developed only in contexts where the need is to grapple with significant meanings, and hence to construct significant knowledge" (Christie, 1989, p. 164). This is reminiscent of the ideas of the educational philosopher John Dewey (1915), who like the humanists and cognitivists that came later, stressed that effective education connects to students' lives. Along similar lines,

Brazilian educationist Paolo Freire (1968) talks about how reading and writing the world should be what reading and writing the word are all about.

Conclusion

My purpose in this chapter has been to look at commonalities between good environmental policy and good educational practice in the hope that, as we gain a better understanding of the outlook necessary to protect the environment, we can extend our gaze to re-vision education as well. In this way, as the quote at the beginning of the chapter suggests, education to protect the environment can serve as a vehicle (a solar powered one, I hope) for much needed reform in education. Such reform will, in turn, empower educationists and students to better achieve the objectives of environmental education.

Two paradigms, labelled A and B, for viewing the environment and education were examined as to four commonalities. First, in Paradigm A nature and students are seen as blank, passive, and to be controlled, while in Paradigm B they are perceived as flourishing, active, and to be given some freedom to develop. In the second commonality, diversity among nature and students tends to be ignored and discouraged in Paradigm A but recognized and encouraged in B.

The third dimension along which the two paradigms were contrasted involves their respective views of nature and knowledge. Are these best considered by isolating the various parts of each (Paradigm A) or by focusing on the links which exist between the component parts (Paradigm B)? Fourth, the two paradigms were compared as to their answers to the question of whether we should emphasize the product and quantity (Paradigm A) or the process and quality (Paradigm B).

It was suggested that the perspectives embodied in Paradigm B are more congenial to the environment and to sound pedagogy. At the same time, it was recognized that Paradigm A is not without merit. Specific educational applications of Paradigm B which lend themselves to integrating language education and environmental education include learner-centredness, cooperative learning, creativity and thinking skills, curricular integration, and widening classroom activities to include the communities in which students live. These are each discussed in separate chapters in this section of the paper. The psychological and linguistic roots of these two paradigms were also explored.

Finally, it should be pointed out that other connections certainly exist between the environmental crisis and educational methodology. These include: the link between the situation of females, on one hand, and the environment and education, on the other; horizontal vs. vertical organizational structuring; and the connection between ecological diversity, on one hand and cultural and linguistic diversity in education, on the other.

CHAPTER SEVEN

LEARNER-CENTREDNESS

As we have seen in Chapter Six, cognitive and humanistic theories of learning highlight the role of the learner as the key actor in the educational drama, as the driving force behind the success or failure of learning. In Table 2 the contrast between a teacher-centred approach and a learner-centred approach is described in terms of the metaphors used (Munby, 1986; Thornbury, 1991).

TABLE 2

Metaphors for Teacher-Centred and Learner-Centred Education*

Teacher-Centred	Learner-Centred
Boss/Employee	Senior Colleague/ Junior Colleague Skilled Professional/ Apprentice
Owner/Tenant	Joint Owners, Family
Depositor/ Bank Account	Fellow Accumulators
Leader/Follower	Fellow Sojourners
Creator/User	Fellow Creators

* Words to the left of the slash mark (/) refer to teachers; words to the right refer to students.

Encouraging students to take a hand in planning, preparing, and carrying out their own learning needs more than just teachers letting go of some control; students must also be ready to assume some of this power. However, many students have developed the habit of depending on teachers and initially resist a more active role. Typically, a Swedish ESL student stated that, "It wasn't her business to learn - 'the teacher has to make us do it'" (Thavenius, 1990, p. 6). In some ways, using a learner-centred approach creates more difficulty for teachers at first because when we give up some of our control, who knows what will happen.

Fortunately, both Thavenius and Smith and Johnson (1993), in a language class in the U.S., found that when they, as teachers, consistently invited students to participate in organizing their own learning, eventually students accepted more responsibility. In fact, many students look

forward to a more learner-centred approach. For instance, one group of high-achieving Singaporean students complained to a researcher that in some of their classes there was, "Too much teaching and too little learning" (Sim, 1979, p. 67).

In a learner-centred class, teachers still play a vital role, motivating, facilitating, and guiding learners. No one advocates that teachers drink tea and play cards in the teachers lounge while students learn by themselves. We need to be there actively helping students toward self-sufficiency, self-reliance, and self-motivation in the subject matter and in learning generally. Indeed, our ultimate aim is to invite students to join us in the community of life-long learners (Breen, 1984; Holec, 1980; Hull 1992).

One way to implement a more learner-centred approach is by using materials created or brought in by students in addition to or in place of textbooks and other materials purchased by or created by the school and the teachers. These learner-generated materials allow students greater input into what takes place in the classroom.

Deller (1990) discusses some of the advantages of learner-generated materials in ESL courses.

1. Students gain more control and ownership of what happens in the classroom. It becomes less the teacher's classroom where students obey the combination landlord, boss, and police officer and more a space where teacher and students cooperate.
2. A better bond forms between the class materials and activities, on one hand, and the students' backgrounds and interests, on the other hand. No textbook, written by authors who never met these students and designed to be used by tens or hundred of thousands of different students could ever be as matched to students as the materials they create or bring in themselves.
3. Learning feels less threatening for students because they take part in creating their learning environment.
4. Teachers receive a great tool for understanding their students better. This enables us to better adapt our teaching to our specific students.
5. In some courses, for example, an English for Specific Purposes (ESP) course for accountants, students may know more than the teacher about the subject matter, while the teacher, of course, is the authority on the second language. Learner-generated materials fit these situations ideally, because the learners often know better than the teacher what second language materials and situations they need to master.
6. Students learn more because by sharing responsibility for creating their classroom environments, students gain insight into the learning process, thus making them more skilful learners.
7. Teachers sometimes do not possess the necessary funds, equipment, or time to create materials on their own to distribute to all the students.
8. Teaching becomes more exciting via the variety and surprises that learner-generated materials provide in contrast to using the same textbook year after year.

Despite the advantages of learner-generated materials, giving up some control of classroom decisions and the safety of the textbook threatens many second language educationists. One reason is that teachers who lack proficiency in the language may worry that, without the textbook, on their own they will not be able to provide a good language model for their students. I have felt this way when I taught Spanish, a language in which I still have much room for improvement.

Another reason for concern about moving to more learner initiative is that, especially in some cultures, students are accustomed to learning from textbooks and depend on them as authorities.

Using learner-generated materials constitutes a step toward a learner-centred curriculum. Subsequent chapters will suggest further methods of striving for this goal. Learner-centredness intersects well with environmental education because just as learner-centred education endeavours to help students become self-motivated, active, and life-long learners, so too does environmental education hope to generate in students a lively interest in and concern for the environment which will be sustained beyond their school careers.

Another link with environmental education is that fundamental to learner-centredness is the principle that student interests and needs be a key ingredient in formulating the curriculum. Today, more than ever, students and the population generally are aware of and concerned about environmental issues. Thus, the integration of environmental education into language courses will often fit well into a learner-centred scheme.

CHAPTER EIGHT

COOPERATIVE LEARNING

> When spider webs unite, they can tie up a lion.
> *Ethiopian proverb*

> One person may hit the mark, another blunder, but heed not these distinctions. Only from the alliance of the one, working with and through the other, are great things born.
> *Saint-Exupery, The Wisdom of the Sands*

As discussed in Chapter Six, we too often treat both nature and knowledge in isolation and sever natural connections. For instance, in some cases the agriculture industry failed to see or chose to ignore the fact that the pesticides they were spraying to kill insects also harmed the birds that lived nearby and the agricultural workers who applied the pesticides.

In education, this severing of natural connection takes many forms. People's natural urge to work with others, the desire for connections with fellow students, is often vilified as cheating. Students, sitting in their own desks in long, well-spaced rows, are told not to talk to those sitting next to them. If they need help, they are to ask the teacher only. Also, grading systems frequently put learners in competition with each other.

However, recently there has been a surge of interest in ways that we can encourage and allow students to connect with a powerful resource for learning - their fellow students. Theory, research, and new methods have focused on how students can collaborate to learn and learn to collaborate. The lesson from the perspective of environmental education is that just as we need to work together to save the environment, so too do we need to pool our efforts to learn more.

Cooperative learning is one name for this movement to bring into the classroom students' natural affinity for collaborating. Following Davidson (1990), various characteristics of cooperative learning can be set forth:

1. A task for group completion, discussion, and (if possible) resolution;
2. Face-to-face interaction;
3. An atmosphere of mutual helpfulness with each group;
4. Individual accountability (everyone in the group does their share).

While most cooperative learning methods include these first four points, others would also include some or all of the following concepts:

5. Heterogeneous grouping (for example, by gender, proficiency, first language)
6. Explicit teaching of social skills (for example, encouraging others to participate, disagreeing politely, taking turns)
7. Structured positive interdependence (dividing roles and resources, offering rewards, etc. to encourage mutual helpfulness)

In hundreds of research studies involving different age levels and subject areas, cooperative

learning has usually been associated with the following outcomes:

1. Greater academic achievement;
2. Enhanced self-confidence;
3. Improved interethnic relations;
4. Better use of social skills.

(See Johnson, Johnson, & Holubec, 1990; Kagan, 1992; and Slavin, 1990 for reviews of the research and for descriptions of cooperative learning methods.)

Several different explanations have been given for the positive outcomes associated with cooperative learners. One's explanation depends in part on one's perspective on the psychology of learning. How cooperative learning gets implemented also differs according to educationists' views of how best to aid the learning process. Cooperative learning's positive effect on students can be viewed from behaviourist, humanist, and cognitivist perspectives (Jacobs, 1990b; Slavin, 1990).

Behaviourists stress the importance of group contingencies. In other words, because the cooperative learning activities are structured to encourage mutual helpfulness and individual accountability, everyone needs to work together in order to earn group rewards. Group contingencies work in two steps. One, teachers offer rewards or punishments to student groups. Two, the group members apply rewards or punishments to each other.

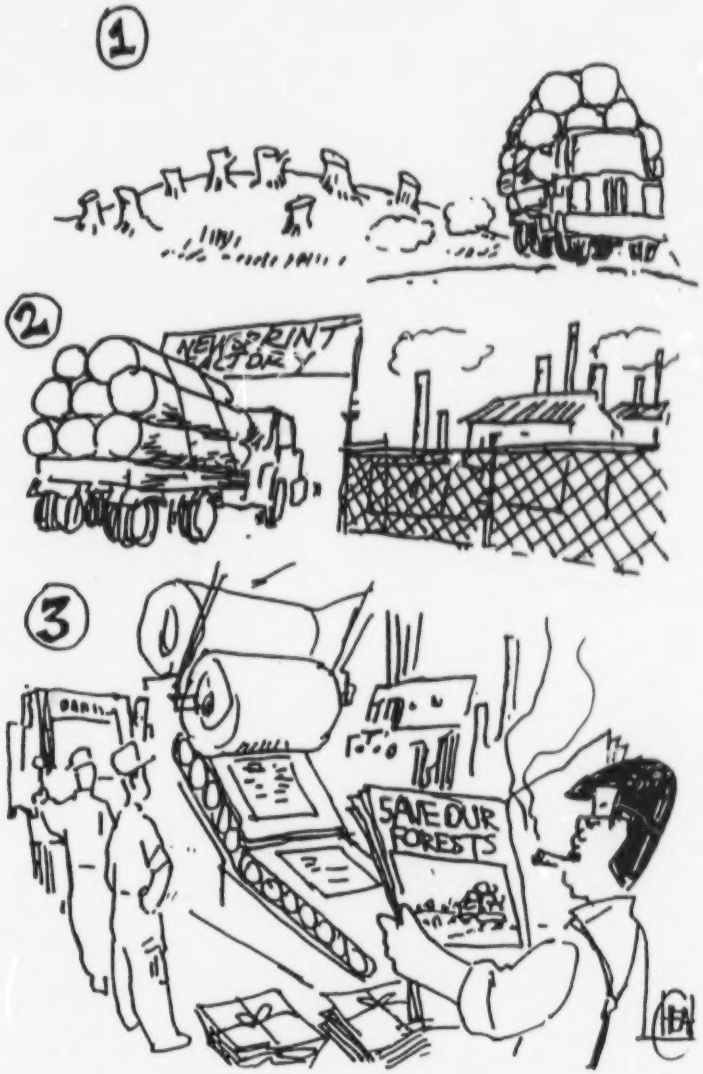
Humanists support cooperative learning for other reasons and often organize it differently. They believe cooperative learning succeeds by giving students more freedom, allowing them to enjoy working with others, inviting them to be more active, and creating a less stressful atmosphere. All these factors, humanists feel, increase student motivation to learn in and out of school.

Cooperative learning appeals to those with a cognitive perspective for many reasons. For example, the peer tutoring that goes on in cooperative groups causes students to understand the subject matter more deeply in order to teach it to others. Similarly, we educationists often find that only when we need to teach something to our students do we really come to grasp it fully. Cooperative learning affords students this same vital opportunity. Further, from a cognitive perspective cooperation promotes learning by providing multiple opportunities for students to discuss, debate, and exchange ideas (McDonell, 1992).

While not advocating that students always study in cooperative groups, many second language educationists see cooperative learning as providing multiple advantages for their students (Olsen & Kagan, 1992). Among the advantages that cooperative learning provides second language (L2) learners are:

1. more opportunities to practice the L2.
2. practice in a greater variety of roles and situations.
3. more chances to integrate L2 learning with content learning.
4. more negotiation of meaning.
5. greater chances for individualizing instruction.
6. less anxiety.

In conclusion, cooperative learning facilitates learner-centredness by increasing student talk and by giving students more responsibility over their own learning. Cooperative learning also prepares students for helping the environment by, to mention just one way, giving them a venue for practising the cooperative skills which are necessary to solving our common environmental problems.



This ironic cartoon shows trees being cut down (#1); to make newsprint paper (#2); which is used to print newspaper stories about we should save forests (#3). The cartoon raises the question of our sincerity about protecting the environment. Are materials about the environment, such as the one you are reading now, really going to help, or are they just making matters worse because trees have to be cut down to produce them? As mentioned in the Introduction, this RELC Publication is printed on 50% recycled paper.

CHAPTER 9

CREATIVITY AND THINKING SKILLS

> Creativity produces not only satisfaction and joy, it also leads to powerful consequences in our lives. It creates possibilities for solving future problems, those we cannot yet anticipate, in the coming decades.
>
> *Utami Munandar and Semiawan (1988, p. 50)*

Allowing students space to exercise and develop their creativity forms an essential part of a learner-centred educational framework. The concept of creativity forms part of the larger educational domain of thinking skills.

Thinking Skills Generally

As mentioned in Chapter Six, cognitive and humanistic psychologies stress the need for people to possess adequate thinking skills. They reject the behaviourist view that students are receptacles of knowledge and that educationists' task is to make sure students master specific bodies of knowledge. One reason for prioritizing thinking skills more than, but not in place of, knowledge accumulation lies in educationists' experience of often seeing that even students who do well on tests of knowledge are not able to apply their knowledge outside of test situations (Worsham & Stockton, 1986). What good is knowledge if we cannot use it to think of ways to understand and successfully act in the varied situations we encounter every day of our lives in and out of school?

Researchers have been able to enhance students thinking skills via explicit instruction (Whimbey, 1980; Worsham & Austin, 1983). For example, in one study, students who had explicit thinking skills training in their English classes significantly outperformed those who did not on the verbal portion of a standardized test (Worsham, 1982). This and similar results have led educationists to infuse thinking skills instruction into the curriculum. Thinking skills instruction lives in the process of learning, not in the content of what is being learned. Skills are taught, but it is recognized that there exist a number of right ways to think about a given task or situation.

What Is Creativity?

The ability to be creative is a key thinking skill. Humanistic educationists believe everyone possesses creativity; it is not the domain of a select gifted few (Maslow, 1970; Rogers, 1969). However, schools have deeply buried many students' creativeness. The right conditions are necessary to bring it back to life (Birckbichler, 1982; Utami Munandar & Semiawan, 1988).

Semiawan (1986, cited in Utami Munandar & Semiawan, 1988) relates creativity and good educational practice generally to the Indonesian concept of "tut wuri handayani." This concept, "stresses the condition of being open and available to all truths, marks diversity, and reflects integrity and identity and is based on the principles of democracy" (Utami Munandar & Semiawan, 1988, p. 37)

According to Guilford (1968), creativity consists of four abilities: fluency, flexibility, elaboration, and originality. Fluency is the ability to generate many ideas. Quantity is the key. Flexibility is the ability to create a wide variety of different possible solutions. Elaboration is the ability to add on to a solution. Originality is the ability to generate unique, unusual solutions.

Rothenberg and Hausman (1978) describe four phases in creativity. The first phase is the preparation phase. Here, the problem is investigated broadly and deeply. Knowledge and skills are developed. In the second phase, incubation, the problem is put aside and not given conscious thought. The third phase, illumination, is what we usually think of as the entire creativity process. In the illumination phase, new ideas come to us. Finally, we reflect upon and test our new ideas in the verification phase.

Encouraging Creativity

Schools can help encourage creativity in several ways, just as they can invite the development of thinking skills generally. First, to be creative, students need to feel psychological safety. This means that teachers express unconditional faith in students' ability. In such an atmosphere, students will feel free to try new ideas and take risks, instead of worrying that they must parrot back what their teachers and books have told them. One means of encouraging risk-taking is focusing on the process, not the product. In other words, how students go about a task is ultimately more important than how the task turns out the first few times they try.

Second, researchers suggest that highly creative people form their own judgements rather than relying on others to evaluate what they do. To help students in this regard, we need to allow them to judge their efforts for themselves. In the teacher-centred classroom, teachers are the sole authorities on what is right or wrong, and students are taught to always look to the teacher for verification. Part of changing this involves teachers trying to see things from the students' point of view.

A third way to encourage students' creativity is to promote curiosity and persistence. Highly creative people are usually strong in these traits. Teachers can invite curiosity and persistence by allowing students to choose their own topics and to work on them for sustained periods, rather than jumping from one short teacher-imposed drill to another. An integrated curriculum provides many opportunities for such sustained projects.

Unfortunately, studies suggest that a significant percentage of teachers often prefer students who exhibit less of the characteristics of creativity, i.e., students who are less independent, less curious, less self-motivated (Torrance, 1965; Utami Munandar, 1977; 1982). Perhaps teachers worry that if they give up control and allow students more freedom, students will wander aimlessly, wasting their time and developing poor study habits. Teachers wonder what their role will be in these more learner-centred classrooms. What will they say if an administrator walks by? In fact, teachers have a vital role to play in learner-centred classrooms. Students still need guidance and control, but in a less authoritarian, directive manner. Further, teachers can model creative traits by sharing with students what they are curious about and telling students about their own independent explorations in learning.

The best-known means of enhancing creativity in students is through the types of questions used in the classroom. Here, the most prominent distinction is between convergent and divergent questions. Convergent questions are those with one right answer derived from the given

information. On the other hand, divergent questions have a number of wide-ranging plausible alternative answers. Divergent questions encourage creativity by providing students with the freedom to generate many possible answers.

A related way of characterizing questions is according to whether they are less or more cognitively demanding. Bloom (1956) described six types of questions:

1) knowledge questions, which involve recall of information;
2) comprehension questions, which involve an understanding of information;
3) application questions, which call for students to use their knowledge to solve problems;
4) analysis questions, which require the answerer to break down complex information into simpler parts;
5) synthesis questions, which involve taking information and using it to create something new; and,
6) evaluation questions, which require students to use what they know to judge something.

Bloom divided the six types of questions into lower-order - knowledge and comprehension - questions and higher-order - application, analysis, synthesis, and evaluation - questions. Cole and Williams (1973) found that higher-order questions were associated with more complex thinking by students. This finding is not surprising; higher-order questions signal students that teachers encourage them to think and believe they are capable of using their minds creatively.

Another distinction between types of questions merits attention when considering how to give students space to be creative. That is the difference between display and referential questions. Display questions ask for information that the questioner already has. An example of a display question would be if the teacher is looking at their watch and asks students, "What time is it?" The teacher already knows the answer but wants to see students *display* either their ability to tell time or their ability to talk about time in the target language.

In contrast, a referential question asks for information the questioner does not already know. Examples of referential questions would be if the teacher asks students, "What time did you wake up this morning?" or "What time do you like to wake up in the morning?" Referential questions may be divergent or convergent, but either way, they certainly bring the classroom closer to the real world. How many times outside of school do you hear people ask questions to which they already know the answer? Further, research suggests that referential questions promote language acquisition by encouraging students to talk more (Brock, 1986).

Another factor which may encourage creativity is wait time, i.e., the amount of time that students are given to answer a question (Rowe, 1974). Short wait times are associated with drills using convergent display questions. Providing students more time to think before they answer may help build a more relaxed atmosphere, one in which students will feel psychologically safer and, thus, freer to be creative. Further, increasing wait time may be one way of showing that teachers have high expectations for students.

Schools can model and encourage creativity via a more horizontal authority structure. This is part of what learner-centredness is all about, encouraging students to be active in their own learning rather than following or disobeying orders from the boss/teacher. As mentioned in Chapter Eight, cooperative learning provides a means of moving toward increased student authority.

Creativity may be promoted not only by a flatter authority hierarchy in the classroom, which increases student control, but also by giving teachers more say in shaping overall school policy. Greater teacher involvement in decision making on a schoolwide level may not only increase teachers' commitment and professionalism, but also, in the process, enhance their own creativity.

The challenges we face in protecting the environment sometimes seem overwhelming: safeguarding the ozone layer, developing alternatives to fossil fuels, making sure that everyone has a decent standard of living without destroying nature, etc. The creativity and general thinking ability of ourselves and each and every one of our students will be sorely needed to meet these challenges. Environmental education presents both a means and a reason for helping to develop these abilities in our students.

CHAPTER TEN

THE INTEGRATED CURRICULUM

Environment is considered as the sum total of all factors that affect an organism. Environment is holistic. It contains the interdependent dimensions such as the physical, biological, social, cultural, political, economic, aesthetic and ethical. The holistic concept of the environment has been developed by UNESCO and has been used as an important guiding principle in the development of formal and nonformal environmental education.

A. Ghafoor-Ghaznawi, Chief, Environmental Education Unit, UNESCO (1993, p. 2)

As language teachers we are the most fortunate of teachers--all subjects are ours. Whatever (the students) want to communicate about, whatever they want to read about, is our subject matter.

Wilga Rivers (1976, p. 96)

An important theme in education these days is integration. The old syllabus broke learning into separate compartments, with students, for example, learning mathematics for 50 minutes, dropping that and studying English for another 50 minutes before dropping that too to study history. Going from class to class felt like changing from one tv show to another. Each subject was treated as completely unrelated, its own self-contained fragment. A recent New York State, US, Teacher of the Year put it well, "Confusion is thrust upon kids by too many strange adults, each working alone with only the thinnest relationship with each other" (Gatto, 1992, p. 3).

As discussed in Chapter Six, this fragmentation of schooling mirrors the dominant view of the environment, treating each part as a separate entity, mindless of the connections. As Dr. Ghafoor-Ghaznawi explains in the quote at the beginning of this chapter, to solve the environmental crisis we need a holistic approach which integrates all aspects of the environmental picture. So too in education do we need to help students see how the pieces connect to the whole.

Intergrating Language Across The Curriculum

This movement toward integration in education comes in many forms. One example is the concept of writing across the curriculum (Moffett, 1981; Odell, Goswami, & Quick, 1983). The idea here is that students should use writing not only in language arts class, but in all their courses, both to improve their writing skill and because writing aids thinking. Thus, language learning and learning through language become an explicit part of each course.

Just as language is integrated into content areas, so too is content integrated into the language classroom. One way this is taking place in second language classrooms is via the overlapping trends toward content-based language instruction (Brinton, Snow, & Wesche, 1989; Crandall, 1987), English for Specific Purposes (ESP) (Hutchinson & Waters, 1987; Johns, 1991), and sheltered learning (Krashen, 1985; Rosen, 1992).

A key idea behind all three of these related trends is that we do not first learn a language

and then use it to do something, but that we learn language as we use it to do things. In other words, we learn the language by learning in the language. Once again, we connect, we do not separate. In content-based instruction, ESP, and sheltered learning, second language learners improve their ability in their new language at the same time they are learning content important to their jobs, future careers, interests, or academic preparation.

This form of integration makes language class more relevant and motivating for learners. Language class is no longer some place students go to prepare for learning another subject, such as a science student who sits through unrelated grammar exercises to help her better understand her textbook in science class. Instead, in language class students are learning what they need together with the language they need to learn it. Because the environment spans all areas of the curriculum, it provides an ideal vehicle for the integration of language with other subject areas.

Using Environmental Themes

The use of themes provides an additional means of integrating learning. An advantage of themes in language learning lies in the fact that by focusing on one content area for a sustained amount of time, students see the relevant vocabulary a number of different times. This repeated exposure may aid vocabulary acquisition (Parry, in press).

Choosing the environment as a theme is one means of bringing content about the environment to the language classroom. For example, coursebooks for Malaysian secondary school English classes include environmental themes (Bowden, 1992), and the new thematically-based English coursebooks for primary school students in Singapore also integrate environmental awareness (Curriculum Development Institute of Singapore 1992a; 1992b; 1992c). Themes include recycling, global warming, sustainable development, species extinction, and alternatives to fossil fuels.

One technique for integrating environmental themes is to bring in publications about the environment and to urge students to do the same. Nowadays, there exists a wide range of writing on the environment, from books of hundreds of pages to flyers of two pages. These texts are written for people of all levels of reading ability and cognitive development. For example, many environmental organizations produce materials specifically for young children.

Also, because the environment is such a hot topic these days, the media, both print and electronic, provides a great deal of coverage. For instance, last night I saw an article in the local newspaper on how one company turned off two of their three elevators in order to provide its employees with the beneficial exercise of walking up stairs. At the same time, they were conserving electricity. Tonight on television, there is a show about how sharks and crocodiles try to survive as the human presence increases in their habitats. Of course, teachers will want to examine materials for biases and to help students develop their ability to do the same, just as you, no doubt, are applying that same critical reading skill to the present paper.

In discussing with colleagues the notion of integrating environmental education with language education, some confusion has arisen. To clarify, the idea is not that all the activities are devoted to the environment. For example, I am not advocating that everything students read be on environmental themes. Rather, what is being proposed in this paper is that the inclusion of meaningful themes enhances language learning and that environmental education is one theme that educationists may wish to consider. Of course, the actual content of any class will represent some

combination of the demands of the school, society, and government, the students' interests and needs, the materials available, and the teacher's interests and professional judgement.

Even examinations can prove an arena for the integration of environmental themes in language education. Sasada (1992) discusses how the Japanese examination system, with its emphasis on competition and its tendency to narrow students' focus and discourage their creativity, would seem to be completely at odds with the aims of environmental education as elaborated in this paper. However, Sasada found common ground did indeed exist in that a number of the reading texts and writing questions used in university entrance examinations dealt with environmental issues. In addition to focusing students' attention on the environment on the day of the exam, the use of environmental themes on examinations also provides a means of encouraging students to keep abreast of these issues so as to be prepared for the exams.

Integrating Thought And Action

In this paper, integration has mainly been considered in terms of integrating content. Another important sense of the concept of integration exists in the integration of thought and action. Too often, education systems leave a big gap between the abstract and the concrete. Environmental education seeks to bridge this gap. How useful is it if students know a lot about the environment but then do nothing with that knowledge?

In this regard, teachers can be important models for their students. We need to make sure our actions match our words (Brennan, 1993). As the saying goes, "If you want to talk the talk, you've got to walk the walk." This involves such areas as our means of transportation to school, our use of paper and other classroom materials, and our involvement outside of school in issues affecting the environment. For example, teachers can walk or take public transportation to school. We can print handouts on both sides of the page and reuse paper. Also, we can participate in local environmental causes, such as preserving natural areas. Being a good model for students is an essential role for teachers in a learner-centred approach, as educationists shift from a focus on doing to students to a focus on doing with students.

There are many ways of encouraging students to put into practice what they have learned about the environment and humans' role in it. For example, the authors of The Student Environmental Action Guide, described in Chapter Three, recommend many ways that their fellow students can be involved, right on their campus, in protecting the environment, such as issues of electricity use, transportation, recycling, campus plants and trees, and course content.

Along similar lines, in the Canadian province of Ontario new guidelines require schools with more than 350 pupils to audit the amount of waste they create and to implement programs to significantly reduce their waste generation (Corbett, 1993). Schools have responded in many ways, including using worms for composting garbage (vermi-composting), recycling, and precycling by eliminating disposable plates and cups in the canteen. Corbett reports that environmental efforts in schools often have positive effects beyond the school grounds, as students spread the message to adults. The next chapter on linking with the community and the activities in Section Three of this paper provide additional ideas on how to invite this beneficial interaction.

CHAPTER 11

LINKING ENVIRONMENTAL EDUCATION WITH THE COMMUNITY

> Environmental education must look outward to the community. It should involve the individual in an active, problem-solving process within the context of specific realities, and it should encourage initiative, a sense of responsibility and commitment to build a better tomorrow.
>
> *United Nations, Tiblisi Declaration (1977)*

Connecting education with students' lives, fundamental to humanistic and cognitive approaches to learning, needs to include forging links with the communities where students live. These links can take many forms. For instance, discussions of environmental concepts in textbooks can be expanded and enlivened by including and investigating similar phenomenon in near students' homes. Also, people from the nearby community can come to the classroom, for example, to share their experiences and ideas.

The focus in this chapter is on students participating in activities outside the school grounds. Learner-centred educationists have long advocated breaking down the walls that separate schools from the world in which students live the rest of their lives (Dewey, 1915; Freire, 1968). They believe that too much of what happens in schools is artificial, isolated from the real world. (See Ashworth, 1985 for specific second language ideas.)

A Sri Lankan Example

Uppal (1988) describes several ways that education can be integrated with the community for both the betterment of the community and the enhancement of student learning. In the mid-1980s, Sri Lanka faced a major problem of pesticide poisoning of agricultural workers. Children aged 10 to 12 were trained to understand the problem and then went out to educate farmers and their families about how to use pesticides more safely.

The Sri Lankan project followed a model in which students first learn material in the classroom and then take this knowledge out to the community. Uppal (1988) suggests that this model may be deficient because a gap often exists between textbook knowledge and the real world. Because of this gap, people in the community may be reluctant to accept students' recommendations.

An Example From India

In a more integrated model, students use what they have learned in the classroom to collect data in the community in order to gain a more grounded understanding of the situation. People in the community may now more readily accept what students have to say. A project along these lines took place in 1986-88 in rural Madhya Pradesh state in India, an area plagued with water-borne diseases (Uppal, 1988). School children and college students participated, along with some of their teachers. The first step was for the students and their teachers to take a week-long training workshop in environmental chemistry, which included how to conduct water tests.

In the second phase of the project, students collected and analyzed water samples from common sources of drinking water. Next, students surveyed people in the communities to inform them of the project, find out what they knew about the potential dangers of drinking polluted water, and see if people had noticed any problems which might be linked to contaminated water.

The fourth step took place in another workshop at which participants discussed their findings and deepened their scientific knowledge. Finally, students presented their findings at a public meeting. Uppal notes that in addition to increasing their scientific knowledge, the project also gave students opportunities to improve their communication skills during the survey and presentation phases. Also, the project generated such interest among both students and teachers that they decided to set up a volunteer environmental group, "Neer" (water) to conduct activities concerned with the quality of the air, soil, and water in the area.

Other Examples And Ideas

Such projects go beyond academic thinking to involve students in practical actions. They integrate the world of school with the rest of students' lives, thus making learning more real and rewarding. Another example of students helping to protect the environment occurs in Singapore where schools are allocated stretches of beach which their students have the responsibility to keep clean (Lee, 1993). In Malaysia, environmental education centres serve both students and tourists (Bowden, 1992). In this way, environmental education and ecotourism are linked. By creating these centres at important wildlife sites, such as mangrove swamps and bird sanctuaries, the presence of the centres protects these areas from destruction.

These outside activities often involve a lot of organizing. It is difficult to control everything and to know exactly how it all will turn out. On one hand, this can be bad because a lot of teacher time is used, and we really need to be on our toes. On the other hand, such activities provide teachers with opportunities to be models active, inquiring scholarship for students. Hopefully, students will want to follow our examples and share the work with us.

Three of the four activities described in Section III of this paper invite students to integrate their classwork with their lives outside school. Part of activity one involves students in interviewing older family members or neighbours about how the environment of their community has changed. Activity three deals with the packaging of consumer goods. Students are asked to collect such packaging, bring it to school, and discuss ways to reduce the amount of waste created by packaging. In activity four, students are requested to make resolutions about what they can do to help the environment. While some of these resolutions may involve in-school projects, many may entail off-campus endeavours.

There are many other examples of students going into the community to learn about and aid the environment. What are the environmental problems near your school? Are there any community environmental activities which students can participate in or investigate?

SECTION III

ACTIVITIES

The purpose of this section is to suggest a few sample environmental education activities for the language classroom which demonstrate the methodologies recommended in Section Two. As a preface to these activities, I would like to discuss a conflict I recognize in my coexisting roles of classroom second language teacher and writer of materials for other teachers.

As a classroom teacher, when I create materials for my classes or when students generate ideas for classroom activities, I feel a bit sad that these good ideas are seldom shared with other teachers and students. The same isolated creation process is taking place in the other classrooms in my school and in other schools. Everyone is reinventing the wheel. Sharing ideas between classrooms and schools offers one way of minimizing this duplication of effort.

At the same time, a good side exists to this localized creation of curriculum. Coursebooks from publishers, often distant in both time and place, do not have the same close connections to students. Thus, when I create materials for other classrooms, I realize that they will be inadequate to the specificity of each of the individual classrooms in which they are used. With that in mind, I urge you to feel free to adapt these activities in whatever way you see fit.

ACTIVITY ONE - Songs About The Environment

Introduction

This activity has four parts. In part one, students learn a song about the environment by way of a cloze procedure. In part two, students discuss higher-order questions (see Chapter Nine) about the content of the song. In part three, students do investigation in their own communities related to the theme of the song. Finally, in part four, students are invited to create their own versions of parts one, two, and even three with songs of their selection.

Part 1

Objectives:

1. To invite students to enjoy a song with an environmental theme.
2. To practice listening and reading comprehension.

Suggested Procedures:

1. Photocopy the cloze version of the song. Or, write it on the board or on a transparency.
2. Discuss the title of the song. Ask students what it might be about.
3. Ask students to sit in pairs and pass out one copy of the cloze version of the song to each pair.
4. Play the song once. Ask students to listen with their pencils and pens down. Then briefly

discuss the main message of the song.

5. Play the song again and ask students to try to fill in the blanks. One student is responsible for the odd numbered blanks, and the other is responsible for the words in the even numbered blanks.
6. Besides being a listening cloze, it is also a reading cloze because students can look at the text to get clues. Because some of the song's verses are repeated elsewhere, students may use this to find which words to put in the blanks. This is not really cheating. Actually, students are using a valid strategy of looking elsewhere in the text for clues to words they do not know.
7. After making sure everyone knows the words for all the blanks, play the song at least once more, encouraging students to sing along if they wish.

Variation - Make two cloze versions of the song. Version 1 has the odd numbered blanks filled in, and Version 2 has the even numbered ones filled in. Each member of the pairs gets one version. After listening to the song, they check each other's answers. If an answer is wrong, they give their partner clues to help them figure out the word that is actually sung.

SHORT SUPPLY

Tracy Chapman
Matters of the Heart
Elektra Entertainment, 1992

1	Where are	19	Don't you see
2	The sunny days	20	Don't you see
3	The blue skies	21	All these things nowadays
4	The flowers for the children	22	Come in short supply
5	The colours for their eyes?		
		23	It's time that we
6	Don't you see	24	It's time that we
7	Don't you see	25	Make a space in our hearts
8	All these things nowadays	26	And open our eyes
9	Come in short supply		
		27	Where are all the grassy hilltops
10	It's time that we	28	Clean air to breathe
11	It's time that we	29	Pure water to drink of
12	Make a space in our hearts	30	Beautiful sights to see?
13	And open our eyes.		
		31	Don't you see
14	Where are	32	Don't you see
15	All the sandy beaches	33	All these things nowadays
16	Fishes in the sea	34	Come in short supply
17	Birds to sing for daybreak?	35	It's time that we
18	Where are all the trees?	36	It's time that we

37 Make a space in our hearts
38 And open our eyes

39 Or there'll be no more you
40 There'll be no more me
41 There'll be no more children

42 All we know will cease to be
43 Don't you see
44 Don't you see

45 The things of this earth
46 Keep us alive

47 It's time that we
48 It's time that we
49 Make a space in our hearts
50 And open our eyes

51 Where are the sunny days?
52 Blue skies

53 The flowers for the children
54 All the colours for their eyes
55 All the sandy beaches
56 Fishes in the sea
57 All the birds to sing for daybreak

58 Where are
59 Where are
60 Where are all the trees?

61 Don't you see
62 All these things come in short supply
63 It's time that we
64 Make a space inside our hearts
65 And open our eyes

CLOZE VERSION

1 Where are
2 The sunny days
3 The blue (1)_____
4 The flowers for the children
5 The colours for their
(2)_____?

6 Don't you see
7 Don"t you see
8 All these things nowadays
9 Come in (3)_____ supply

10 It's time that we
11 It's time that we
12 Make a space in our
(4)_____
13 And open our (5)_____

14 Where are
15 All the sandy (6)_____
16 (7)_____ in the sea
17 (8)_____ to sing for
daybreak?
18 Where are all the (9)_____?

19 Don't you see
20 Don't you see
21 All these things nowadays
22 Come in short supply

23 It's time that we
24 It's time that we
25 Make a space in our hearts
26 And open our eyes

27 Where are all the grassy hilltops
28 (10)_____ air to breathe
29 (11)_____ water to drink of
30 (12)_____ sights to see?

31 Don't you see
32 Don't you see
33 All these things nowadays
34 Come in short supply

35 It's time that we
36 It's time that we
37 Make a space in our hearts
38 And open our eyes

39 Or there'll be no more you
40 There'll be no more
(13)_____
41 There'll be no more children
42 All we know will cease to
(14)_____

43 Don't you see
44 Don't you see
45 The things of this (15)_____
46 Keep (16)_____ alive

47 It's time that we
48 It's time that we
49 Make a space in our hearts
50 And open our eyes

51 Where are the sunny days?
52 Blue skies
53 The flowers for the children
54 All the colours for their eyes
55 All the sandy beaches

56 Fishes in the sea
57 All the birds to sing for daybreak
58 Where are
59 Where are
60 Where are all the trees

61 Don't you see
62 All these things they come in short supply
63 It's time that we
64 Make a space inside our hearts
65 And open our eyes

The Words That Go In The Blanks

1. skies
2. eyes
3. short
4. hearts
5. eyes
6. beaches
7. Fishes
8. Birds
9. trees
10. Clean
11. Pure
12. Beautiful
13. me
14. be
15. earth
16. us

Part 2

Objectives:

1. To encourage students to consider environmental issues.
2. To encourage students to use higher-order thinking.

Procedures:

1. Explain the different types of questions described below. Students can practice writing the various types of questions. Please do not treat these question types as hard and fast categories. Most questions contain elements of more one category. The point is to move away from questions which call for no more than retrieving information from the text. We need more questions which encourage the kind of higher-order thinking described in Chapter Nine. (Younger and beginning students may not have the language to deal with steps one and two, but teachers can, by example rather than by explanation, give students practice in asking and answering higher-order questions (types three-six), types which

occur too infrequently in many classrooms.)

2. Ask students to read the questions about the song "Short Supply." Ask them to suggest which types those questions are. Again, there are no hard and fast answers. The key is whether a question involves thinking or just reading from the paper.
3. In pairs, students alternate asking the questions to one another. They also make up two questions of their own to ask their partner. These should be questions of types three-six.
4. Pairs combine to form foursomes. Each person shares their partner's answers with the other pair. (Steps 3 and 4 are similar to the cooperative learning structures Three-Step Interview and Think-Pair-Square [Kagan, 1992].)
5. Whole-class discussion of the answers.
6. As a follow-up, students can be encouraged to ask and answer questions of types three-six in other settings.

QUESTION TYPES

1. **Knowledge** questions ask for people to remember or recognize information that is in their textbook or was told them by the teacher. Examples: "Where is the Amazon rainforest?" "What are three fossil fuels?" when students have already been given this information.
2. **Comprehension** questions ask for understanding. Examples: "Explain how the greenhouse effect occurs." "What is the main cause of global warming?"
3. **Application** questions ask people to use their understanding. Examples: "Do you think that global warming will get worse? Why?" "From your experience, why don't people recycle more things?"
4. **Analysis** questions ask people to look at the individual parts of a situation. Examples: "Compare two different types of packaging in terms of their effect on the environment." What are reasons for and against the use of solar powered cars?"
5. **Synthesis** questions ask people to use their skills to create new ideas by combining or restructuring ideas. Examples: "What would a plan for saving water in your community look like?" "What can be done so that poor people can have clean drinking water and sanitary facilities without doing too much damage to the environment?"
6. **Evaluation** questions ask people to make judgements. Examples: "Should we protect plants and animals even if they are of no value to humans?" "Should the proposed new highway be built?"

Questions About The Song "Short Supply"

1. In line 5, what does "colours for their eyes" mean?
2. What do you think happened to the trees in line 18 of the song?
3. In lines 12 and 13, what does it mean to "make a space in our hearts" and to "open our eyes"?'
4. Where you live, which of the things in the song are in short supply?
5. Why are they in short supply?
6. What can you do to stop what it says will happen in line 42: "all we know will cease to be"?
7. Of all the things that are disappearing, which is most important to you? Why?
8. Nature may nowadays be in shorter supply, but we have more of other things, such as roads and buildings. Which way is better?

Part 3

Objectives:

1. To encourage students to find out about the environmental changes that have taken place where they live.
2. To encourage students to imagine what the future might hold.

Suggested Procedures:

1. Ask students to interview adults where they live to find out about environmental changes that have taken place. The older the person is, the better. You might first want to generate a list of categories of changes to ask about. The song provides a good start.
2. Interviews should be done alone, but students can form small groups to present the results of their interviews. They can also use photos, magazine clippings, etc. to illustrate their presentations about the environmental changes.
3. In small groups, students use what they know about the changes which have already taken place to imagine what the place they live now will look like ten years into the future. Their presentations should be accompanied by drawings and explanations of why the changes took place. Each group member should take an equal role in the presentation.

Variation: Students make murals which show what the place they live looked like in the past, what it looks like now, and what it will look like in the future, including the plants, animals, and human-made objects.

Part 4

Objectives:

1. To invite students to share songs they enjoy with the rest of the class.
2. To help students identify the main ideas of a song.
3. To give students practice in asking higher-order questions.

Procedure:

1. Individually or in small groups, for homework students listen for songs that deal with the environment or related themes in global education. Any other song that has special meaning to a student is fine also.
2. Students write out the words to their song and also make a cloze version leaving out words that are important to the meaning of the song.
3. Students write thinking questions for their songs.
4. Repeat the procedure from Parts 1 and 2 with students leading the class for their songs.

Variation - Students may want to think up an activity, such as the one in Part 3 to precede or follow their song.

ACTIVITY TWO - Using Data To Think About The Environment

Introduction

This activity provides opportunities for students to discuss the third controversy mentioned in Chapter Five on environmental controversies. This debate concerns the relative roles of the developing world, the South, and the developed world, the North, in the protection of the environment and also involves the question of sustainable development.

The data strikingly demonstrate an important phenomenon: the North countries, represented by Norway and the U.S., are much wealthier and use much more resources than do the South countries, represented by Haiti, Malaysia, and Somalia. At the same time, not all South countries are the same. Malaysia, a rapidly developing South country, is contrasted with Haiti and Somalia, two very poor South countries, to demonstrate this point.

Most of the data come from a 1992 UN poster entitled "Environment and Population." The rest come from the New Book of World Rankings, 1991, NY: Facts on File. The three categories used may need some explanation. *Gross National Product* per capita refers to the value of domestic output per person plus the net income that residents receive from abroad. It is a broad indicator of the wealth a country produces.

The second category, *carbon dioxide release per capita*, refers to the estimated number of metric tons of carbon dioxide per capita added to the air in 1989 from fossil fuel burning, for such purposes as driving cars, running factories, and air conditioning buildings. Because carbon dioxide is one of the main forms of air pollution and is believed to contribute to global warming, data about carbon dioxide release provide an indicator of how much a country contributes to polluting the earth's air. Imagine what our air would be like if the South countries burned as much fossil fuels as the North countries!

People without safe drinking water is defined as the percentage of urban people without piped water or living more than 200 metres from a public standpipe and rural people who must spend a major part of the day fetching water. Safe water includes treated surface water and untreated water from protected springs, boreholes, and sanitary wells. Data are from 1988 or the most recent year available. A great deal of investment and environmentally unfriendly construction is necessary to secure safe water for people. Yet, unsafe drinking water is a major environmental hazard for poor people, contributing to millions of deaths every year.

Objectives:

1. To provide data for students on the disparities in resource use and resource need.
2. To encourage students to discuss the issues involved.
3. To integrate environmental education, mathematics, and social studies in a language course.

Suggested Procedure:

1. Show students the table and the bar graphs.
2. Ask students to calculate how many people from each of the three South countries it takes to equal the GNP per capita or the carbon dioxide release per capita of each of the two North countries. To obtain this number, divide the per capita figure for the North country

by the per capita figure for the South country. The result can be represented by drawings, e.g., a drawing of one person from the North country next to all the people from the South country it takes to equal that one person's amount of carbon dioxide release.

3. There are other mathematical and graphical applications for the data, depending on your students' level of ability in this area. If students are taking mathematics at the same time, you might want to coordinate with their mathematics teacher. You may find that some students are relatively better in mathematics, while others are relatively more proficient in language. This can provide a basis for forming cooperative learning groups.
4. In small groups, students discuss implications of the data for dealing with the environmental crisis. Questions to discuss could include:

   a) Should people in North countries use less resources?
   b) If so, how would you convince people in the North to use less?
   c) Should people in South countries use more?
   d) Can people in the South have more of the things that people in the North have without doing more harm to the environment?
   e) Why is there such a big gap between North and South countries?
   f) What other differences might there be between South and North?
   g) Does everyone in South and North countries live the same or are there differences, small or large, between people in the same country?

You may wish to encourage group members to take on roles. Such roles could include a recorder, who writes down the group's ideas, an encourager, who tries to see that everyone participates in the discussion, a timekeeper, who urges the group to keep within prescribed time limits, and a reporter, who briefly shares the group's discussion with the whole class.

Variation - In pairs, one person receives the data in table form and the other receives them in the form of the bar charts. Working alone, those with bar charts construct tables and vice versa. Then, they check each other's work.

Table 3

Data for Comparing South and North Countries

Countries	Gross National Product per Capita 1990 (US$)	Carbon Dioxide Release per Capita 1989 (metric tons)	People Without Safe Drinking Water 1988 (%)
Haiti	370	0.1	60
Malaysia	2,340	2.8	39
Norway	23,120	11.0	0
Somalia	150	0.2	69
USA	20,850	19.7	1

Figure 1

GNP Per Capita 1990 (US$)

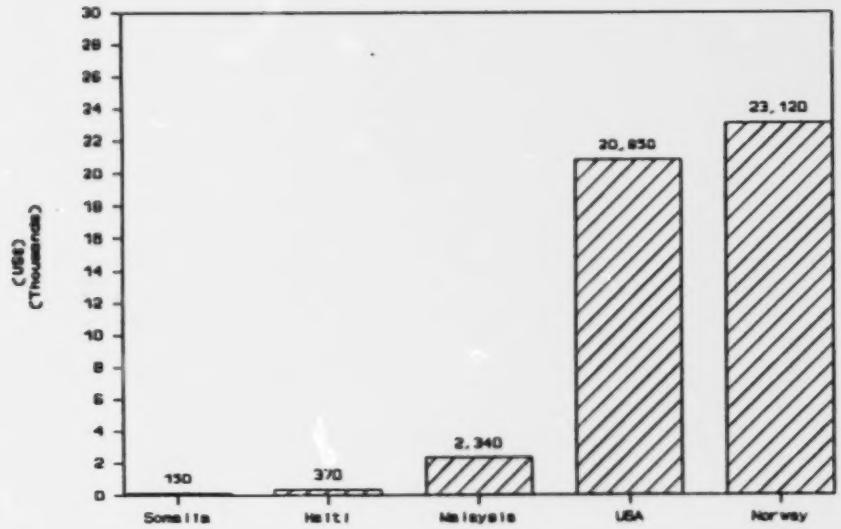


Figure 2

Carbon Dioxide Release Per Capita
1989 (Metric Tons)

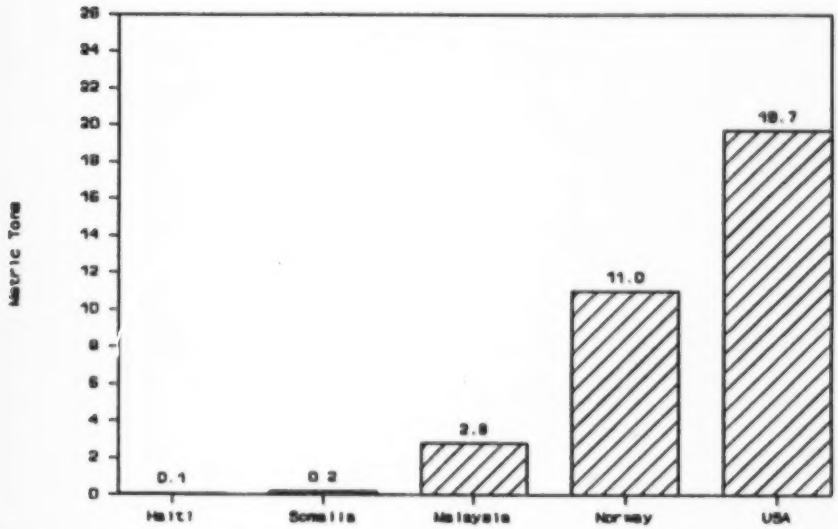
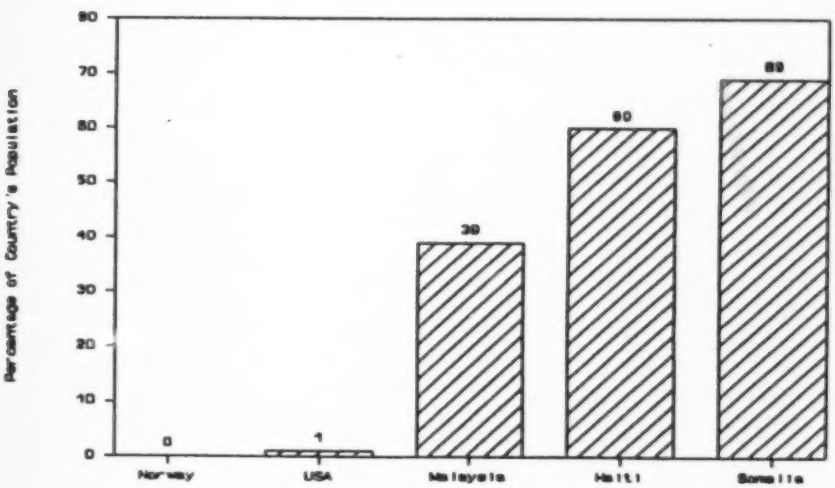


Figure 3

People Without Safe Drinking Water 1988 (%)



ACTIVITY THREE - Making Wise Buying Decisions

Source: Adapted from Howe & Disinger, 1990

Introduction

Particularly in urban areas, many products that we buy come with large amounts of unnecessary packaging. In this activity, students focus their attention on the decisions they make as consumers. Many important thinking skills are involved in the activity, such as categorizing, comparing and contrasting, identifying cause and effect relations, and evaluating.

Another reason I chose the activity is that it presents a way for students to make a small contribution to the environment. As part of this activity you may wish to ask students to investigate what recycling programs exist in their area, as this will differ from place to place and has some effect on the categorizing part of the activity.

Objectives:

1. To provide students with information for improving their ability to make consumer decisions which affect the environment.
2. To link classroom content with students' lives outside of school.
3. To provide students with practice in making presentations.

Materials: nutshell, orange peel, banana peel, paper shopping bag, glass bottle, plastic shopping bag, plastic bubble packing, styrofoam container, plastic wrapping.

Suggested Procedures:

1. Tell students that there are three types of packaging and show them examples of each. You may want to accompany this with background readings on recycling, reuse, precycling, and waste management. Government bodies, environmental organizations, and science teachers are good sources for such reading passages.

    a. Packaging from nature: the nutshell, orange peel, and banana peel.
    b. Packaging that can be easily recycled or reused: the paper shopping bag, glass bottle, and plastic shopping bag.
    c. Packaging that can not be easily recycled or reused: the plastic bubble packing, styrofoam container, and plastic wrapping.
2. Request that for the next week, students save types of packaging to bring to school.
3. In small groups, students classify the packaging they have brought into the three types. There may be disagreement about whether or not some packaging is easy to reuse or recycle, so students will need to be able to justify their categorization.
4. Ask students to identify the energy and natural resources used to make the different types of packaging, e.g., plastic comes from petroleum.
5. Ask students to contrast packaging which is necessary with that which is unnecessary, explaining why. Students may also want to speculate on why the unnecessary packaging is used, e.g., to make the product look nicer.
6. Ask students to make suggestions for what they can do to reduce the amount of waste

from packaging, e.g., by bringing their own bags when shopping. They can create a list of suggestions for friends, family, and neighbours.

7. In groups, students can develop radio commercials, posters, etc. to disseminate their suggestions. These should be presented to the class. Students can look for opportunities to do their presentations elsewhere, e.g., other classes at their school or at other schools, for community groups.
8. Ask students if they feel that protecting the environment depends mostly of what individuals do or does the burden fall more on the shoulders of governments and big companies.

Variation - A similar activity can be done by asking students to monitor energy use in their homes, the school, or in other places.

ACTIVITY FOUR - Making Resolutions About Protecting the Environment

Source: Adapted from Deller, 1990; Jacobs, in press

Introduction

Environmental education concerns not just what students know but also what they do. This activity encourages students to think about what role they can play in protecting the environment. Such a role can involve their day-to-day life, e.g., whether or not they recycle, or larger societal issues, e.g., investigating alternatives to pollution from factories.

Objectives:

1. To encourage students to believe they can play a role in bettering the world.
2. To invite students to think about what action they can take to protect the environment.
3. To practice writing and giving feedback on the content of other's writing.

Suggested procedures:

1. The class brainstorm activities that individuals can take to protect the environment, e.g., planting trees, supporting legislation to safeguard the environment from toxic waste. There are many lists of such activities that students can use for ideas. For example, a Singapore organization, Jalan Hijau (The Green Road), produced a leaflet entitled "40 Ways You Can Save the Earth." This is leaflet is reprinted in the Appendix to this paper.
2. Each student chooses one activity and writes out exactly what they resolve to do, why they chose that activity, and how they will do it. For example, a student might be concerned about what they see as excessive amount of packaging used by fast food restaurants for their take away customers. This problem affects the environment because the large amount of paper and plastic used creates a lot of waste. The student could resolve to go to such restaurants to see what actually happens, investigate alternatives, suggest these to the restaurants in person and in writing, collect signatures of fellow customers supporting changes, and then followup on their responses from the restaurants.
3. In pairs, students read aloud their resolutions to their partner who takes notes and summarizes the resolution back to them to check to see if they have understood. Then, the

listener gives comments, asks questions, and makes suggestions.

4. Pairs combine to create foursomes. Each person tells the two people from the other pair about their partner's resolution: what, why, and how.
5. If some foursomes finish before others, they can repeat step 4 with another pair or discuss past resolutions students have made on other themes.
6. After a period of time, e.g., one month, pairs reform and discuss how they are doing in carrying out their resolutions.
7. Students who do not want to do an activity about the environment can make a resolution on another topic, such as improving their language learning, e.g., by doing independent reading at home.

Variations: 1) Another way to combine writing with student activity on behalf of the environment is to suggest environmental action as a topic for the dialogue journals with which students and teachers engage in written communication. See Lucas and Jurich (1990) and Peyton and Reed (1990) for ideas on setting up a dialogue journal programme.

2) Students can make group resolutions, working together to fulfill them. In this case, each group member should do steps 3-6 with people from other groups.

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A free video and game for secondary school students about landfills and about recycling and reducing waste are available by writing to: Recycle This! Customer Information Center, Dow Chemical Company, P.O. Box 1206, Midland, MI 48641-1206 USA. Be sure to specify which video format you need.

JALAN HIJAU - GO THE GREEN WAY
YOU CAN MAKE THE DIFFERENCE

40 WAYS TO HELP SAVE THE WORLD

AT HOME

1. Paper has cash value. Old newspapers & magazines can be sold; used wrapping papers can line kitchen shelves or wrap books. Save greeting cards for children's Art sessions or cut and use as party invitations or book markers.
2. Wash bottles & jars after use for storing pins, clips & nails. You can paint them with coloured enamel paint to contain gifts of sweets, nuts or tea. Alternatively, collect them & sell them to a bottle collector.
3. Make sure taps don't drip - did you know that a dripping tap can waste 9 litres a minute?
4. A leaking WC wastes 200,000 litres in 6 months! Put a little coloured dye in the tank and if colour shows in the bowl without flushing - there's a leak.
5. Wash dishes with a basin of water instead of under a running tap. Use a bucket instead of a hose for washing the car.
6. Return all junk mail. Either send it back to the companies or to the Post Office. If every Singaporean did that each year, just think of the number of trees we could save!
7. Be careful what you spill onto the Earth. Don't put paint, gasoline or bleach into the drainage system, it can pollute the rivers & seas and cause the death of thousands of fish and other marine life.

8. Plant a tree. Trees provide shade and filter the carbon dioxide in the air. If you have a garden, plant 3 or 4. Ask the garden centre what kinds of trees are best suited to the soil & area.
9. Use cloth towels in the kitchen instead of paper towels. They can be re-used after washing.
10. If your fridge is set too cold and many are 5% colder than they need to be - then its using 25% more electricity. Check it.
11. Always wait until you have a full load before using the washing machine. This saves both water and energy.

ON THE ROAD

12. Cars are polluters. Limit the use of the car through car-pooling. Take turns to fetch children to and from school, music or sports or to drive to work.
13. Have one day a week or month - when you leave the car at home and take public transport or walk when it's a short journey - it's healthier! If you must drive, then maintain your car well. A well-tuned car with clean filters uses 9% less petrol and that means less pollutants in the air.
14. Use unleaded petrol whenever possible & help keep the air clean.
15. Correct tyre pressure prevents damage to the tyres and suspension and saves petrol, too.
16. Maintaining a steady 80Km an hour is safer and uses less fuel. At 112KPH it's 25% less efficient in fuel consumption and of course you're more accident prone!

17. Make sure your car air-conditioner does not leak CFC gas. Ask your mechanic to check if you're not sure.

SHOPPING

18 Be a green shopper. Whenever possible, buy products that have as little packaging as possible; refuse that extra plastic bag. When you buy clothes that are already wrapped, ask the assistant to pin the receipt, instead of using another layer of wrapping.

19 More and more shops are offering environmentally friendly products. Shop there ... it will encourage other shops to do the same.

20 Never buy aerosol cans with CFC. They'll be banned from 1993.

21 When you go to the supermarket - take along a reuseable netting basket, they hardly take up any space in your handbag. You can then avoid taking home those plastic bags. Better still, bring along a Jalan Hijau washable bag.

22 Cut up plastic six-pack holders before throwing them away. They can kill sea birds and marine life as they may be mistaken for jellyfish.

23 Don't litter when you go on a picnic in the countryside or to the beach. Bring home your rubbish and dispose of them properly. Plastic containers and cans can take years to disintegrate.

AT WORK

24 Offices are good places to save energy & set good examples. People will take these habits home.

25 Form a GO GREEN group. Call Jalan Hijau for advice.

26 Most companies use flourescent lights which save energy; but they also often leave them on when no needed. Switch off lights when natural light is enough or during lunch time.

27 Use mugs instead of disposable paper cups.

28 Set up a recycling centre with cardboard boxes and label for various items, some of which can be re-used for wrapping, packaging or internal mail.

29 Office air-conditioners are often set too cold. Adjust the thermostat and clean or replace filters once a month.

30 Copy only what you need. Don't waste photocopies & use both sides of the paper.

32 Switch off your computer when not in use & at lunch time.

33 Use electronic mail instead of paper.

34 Use bulletin boards instead of sending memos.

35 Put a small brick or water-filled ballon in the WC closet and save litres and money.

36 Use re-cycled paper for stationery and business cards.

37 Ask the cleaners to use environmentally friendly cleaning products.

38 Spread the GO GREEN message. Have a rubber stamp made, that goes on all outgoing mail and packages:

USE ME AGAIN, I'M RE-CYCLABLE. or
PLEASE RE-USE ME AND HELP SAVE THE WORLD.

39 Ensure company car users share and car-pool when possible.

40 Tinted glass, venetion blinds and curtains will lower air-conditioning bills, as they will deflect sunlight which heats up rooms.

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